VX7 Reference Guide

LXE

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E-EQ-VX7RG-D

JAVA POWERED

Microsoft Windows Embedded

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Revision Notice

VX7 Reference Guide
Upgrade From Revision C to Revision D

Section	Explanation
Entire Manual	Updated all images with the new LXE logo.
Notices	Updated copyrights and trademarks.
Chapter 1 – Introduction	Revised "Accessories" listing.
Chapter 2 – Physical Description and Layout	Revised "On/Off Switch", "Scanner Serial Connector (COM1)", "Printer/PC Serial Connector (COM3)", "Install the 2.4GHz Type II PCMCIA Radio", "Input Panel (Virtual Keyboard)", "Video Subsystem" and "The Display" . Added new section: "Technical Specifications – Screen Blanking Cable".
Chapter 3 – Power Supply	Revised "VX7 Input Power Specifications".
Chapter 4 – System Configuration	Revised "Installed Software", "Start Menu Program Options", "Network and Dialup Connections", "Control Panel Options", "About", "Date/Time", "Keyboard", "Password", "Regional Settings", "Remote Desktop Connection", "Scanner", "Storage Manager", "LAUNCH.EXE" and "Reflash the VX7" sections. Added new sections: "Folders Copies at Startup" and "Enabling GrabTime". Removed section: "Bluetooth Manager". Renamed "VX7 Command Line Utility" to "VX7 Command Line Utilities" and updated section.
Chapter 5 – Wireless Network Configuration	Revised "Profiles Tab" section. Split radio configuration section into two sections "Cisco Radio" and "Symbol radio". Added a new section, "Summit Radio". Each section contains the manufacturer specific configuration information. Moved all certificate generating and installation instructions to a new "Certificates" section.
Chapter 6 – AppLock	New chapter. Information previously included in Appendix B is now referred to as "Single Application". Added Multi Application AppLock to chapter.
Appendix B – Technical Specifications	Added "Revision History" to appendix. Added Summit Radio Technical Specifications.
Appendix C – AppLock	Deleted appendix. Information is now included in Chapter 6, AppLock.

Note: A complete revision history is included in Appendix C, "Technical Specifications".

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Chapter 1 Introduction

Overview

The VX7 Vehicle Mount Computer (VMC) is a rugged, vehicle mounted, PC (Personal Computer) running a Microsoft® Windows® CE .NET operating system and capable of wireless data communications from a fork-lift truck or any properly configured vehicle. The VX7 provides the power and functionality of a desktop computer in a vehicle mounted unit, with a wide range of options:

CPU	400MHz Intel® PXA255
Memory	64 or 128MB SDRAM
Display	Indoor or Outdoor 12.1" display, integrated Touchscreen, adjustable brightness
Network connectivity	2.4 Wireless LAN radio (single or dual antenna) Ethernet port
Audio	Speakers in front bezel, audio jack for headset with microphone
Storage media	Compact Flash PCMCIA Secure Digital (SD)
Operating system	Microsoft Windows CE .NET 4.2
Other options	Extended temperature version (128MB RAM only) RAM Mount™ vehicle mounting

The "VX7 User's Guide" is directed toward the VX7 user. It is delivered on the LXE Documentation CD. It contains safety warnings, descriptions of the controls and connectors, instruction on installing antennas, and day to day operation.

When to Use this Guide

As the reference for LXE's VX7 equipped with a Microsoft Windows CE .NET operating system, this guide provides detailed information on its features and functionality. Use this guide as you would any other source book -- reading portions to learn about the VX7, and then referring to it when you need more information about a particular subject.

This chapter, **"Introduction",** briefly describes this reference guide structure, contains setup and installation instruction, briefly describes data entry processes, and explains how to get help.

Chapter 2 "Physical Description and Layout" describes the function and layout of the controls and connectors on the VX7.

Chapter 3 "Power Supply" describes AC power and DC power connections.

Chapter 4 "System Configuration" takes you through the system setup and file structure, covering all components except the 2.4GHz radio.

Chapter 5, "Wireless Network Configuration" details 2.4GHz radio setup. Configuration for WEP and WPA is included.

Chapter 6 "AppLock" contains explanation and instruction when working with VX7's running AppLock.

Appendix A "Key Maps" describes the keypress sequences for the LXE VMC keyboard.

Appendix B "TalkManager and the VX7" contains information on configuring and using the VX7 with LXE's TalkManager system..

Appendix C "Technical Specifications" lists technical specifications including physical, environmental, display and the radios.

Document Conventions

This reference guide uses the following document conventions:

ALL CAPS	All caps are used to represent disk directories, file names, and application names.
Menu|Choice	Rather than use the phrase “choose the **Save** command from the **File** menu”, this guide uses the convention “choose **File|Save**”.
“Quotes”	Indicates the title of a book, chapter or a section within a chapter (for example, “Document Conventions”).
< >	Indicates a key on the keyboard (for example, <Enter>).
	Indicates a reference to other documentation.
	Differences in operation or commands due to platform type.
	Differences in operation or commands due to software revision.
ATTENTION	Keyword that indicates vital or pivotal information to follow.
	Attention symbol that indicates vital or pivotal information to follow. Also, when marked on product, means to refer to the manual or user’s guide.
	International fuse replacement symbol. When marked on the product, the label includes fuse ratings in volts (v) and amperes (a) for the product.
Note:	Keyword that indicates immediately relevant information.
Caution	Keyword that indicates a potentially hazardous situation, which, if not avoided, may result in minor or moderate injury.
WARNING	Keyword that indicates a potentially hazardous situation, which, if not avoided, could result in death or serious injury.
DANGER	Keyword that indicates an imminent hazardous situation, which, if not avoided, will result in death or serious injury.

Quick Start

This section's instructions are based on the assumption that your new system is pre-configured and requires only accessory installation (e.g. antenna, external keyboard and/or barcode scanner) and a power source.

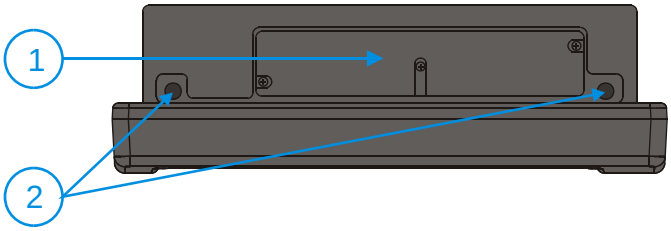
In general, the sequence of events is:

1. Install Vehicle Mounting Bracket on vehicle and secure VX7 in Mounting Bracket Assembly (see "VX7 User's Guide").
2. Connect power cable to the VX7. The power cable can also be connected to a UPS battery pack, which is then connected to the VX7 (see "VX7 User's Guide").
3. Connect accessories to VX7, e.g. scanner, antenna, etc. (see "VX7 User's Guide).
4. Secure all cables to the VX7 with the Strain Relief Cable Clamps.
5. Turn the VX7 on.
6. When instructed, calibrate the touchscreen (see Chapter 4, "System Configuration").
7. The screen may appear white while applications and drivers are loading. When complete, set Date and Time (see Chapter 4, "System Configuration").
8. Configure radio (see Chapter 5, "Wireless Network Configuration").
9. Warmboot to ensure all registry settings are saved.
10. Device is ready for use.

The VX7 and its keyboard should be mounted in an area in the vehicle where it:

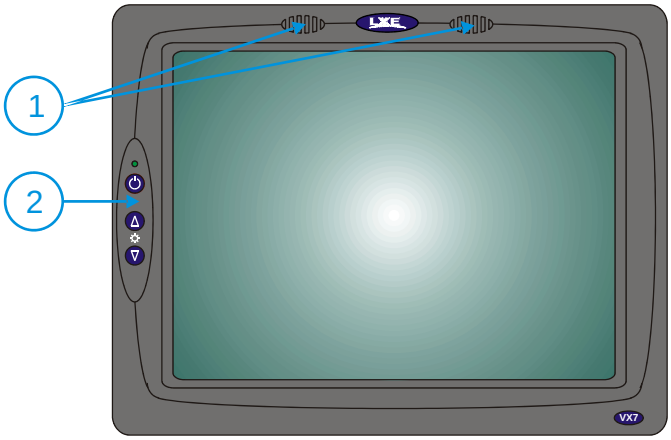
- Does not obstruct the vehicle driver's vision or safe vehicle operation.
- Can be easily accessed by anyone seated in the driver's seat.

Components



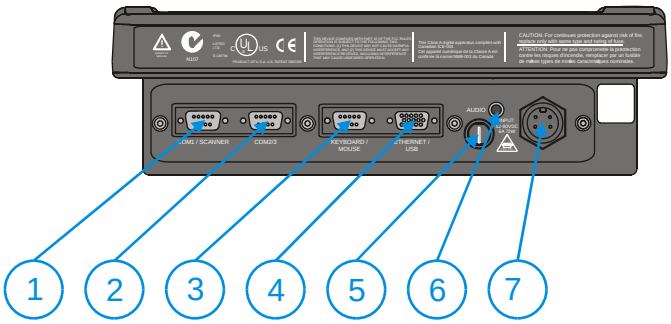
1. Access Panel Cover (See Following Illustrations for Detail)
2. Antenna Connectors or Hole Plugs

Figure 1-1 VX7 Components, Top View



1. Speakers
2. Control Panel (See Following Illustrations for Detail)

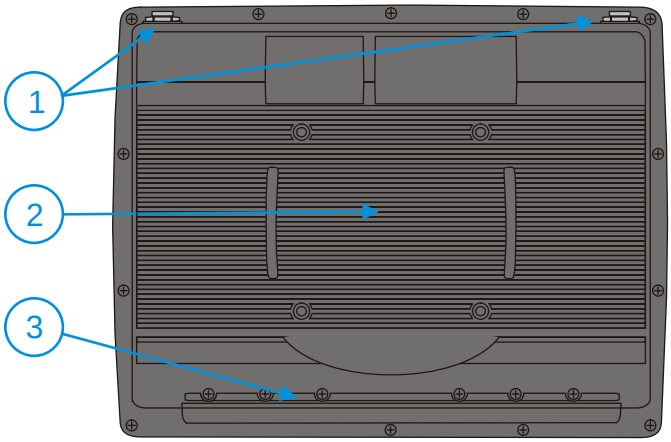
Figure 1-2 VX7 Components, Front View



1. COM1/Scanner Connector
2. COM3 Connector
3. Keyboard/Mouse Connector
4. Ethernet/USB Cable Connector (USB-Host and USB-Client)
5. Fuse
6. Audio Connector
7. Power Cable Connector

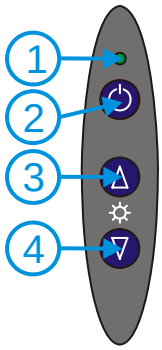
Figure 1-3 VX7 Components, Bottom View

Note: COM1 is configured with Pin 9 +5V. COM3 is labeled "COM2/3" and is configured with Pin 9 RI. Please see Chapter 4, "System Configuration", for details on configuring Pin 9 of the serial ports.



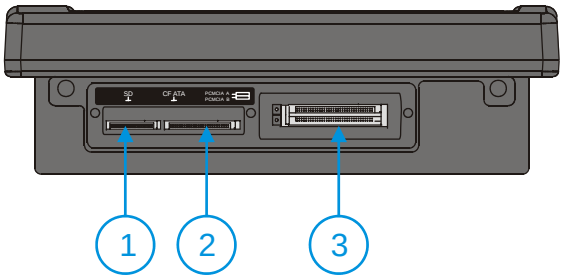
1. Antenna Connectors
2. Bracket Mounting Area
3. Strain Relief Bracket and Screws

Figure 1-4 VX7 Components, Back View



1. Power LED
2. Power Switch
3. Brightness Increase
4. Brightness Decrease

Figure 1-5 VX7 Control Panel



1. SD Memory Card Slot
2. Compact Flash Hard Drive
3. PCMCIA Slots

Figure 1-6 VX7 Access Panel

Note: The tethered access panel cover is not shown in the illustration above.

Data Entry

You can enter data into the VX7 through several different methods. A tethered scanner connected to the COM1 serial port provides barcode data entry, the serial ports are used to input/output data, keyboards provide manual entry and the touchscreen also provides manual entry (simulating a desktop PC's mouse).

Keyboard Data Entry

Refer to Appendix A "Key Maps" for 101-key keyboard equivalent keypresses.

The keyboard is used to manually input data that is not collected otherwise. Almost any function that a full sized computer keyboard can provide is duplicated on the LXE VMT keyboard but it may take a few more keystrokes to accomplish a keyed task.

When using the LXE 60-key keyboard, almost every key has two or three different functions. The primary alpha or numeric character is printed on the key.

For example, when the <2nd> key is selected pressing the desired second-function key produces the <2nd> character i.e. <2nd> + <F1> toggles the CAPS Lock function. The specific <2nd> character is printed above the corresponding key.

Please refer to Appendix A "Key Maps" for instruction on the specific keypresses to access all PC-compatible keyboard functions.

Barcode Data Entry

The VX7 supports an accessory barcode label reading device. Keyboard data entries can be mixed with barcode data entries. Any scanner that decodes the barcode internally and outputs an RS-232 data stream may be used. COM port 1 is designed to be used with a hand held tethered barcode scanner.

> COM1 is set to +5V on pin 9 up to accept input from a barcode scanner by default. To change the setting for pin 9, refer to Chapter 4: "System Configuration" section titled "Serial Port Pin 9" for details.

RS-232 Data Entry

The VX7 accepts input from an RS-232 device connected to either RS-232 port, COM1 or COM3 (labeled "COM2/3"). The data is entered at the cursor position, and the data is subject to all of the barcode/RS-232 input menu parameters, such as truncate.

Touchscreen Entry

Note: The touchscreen should be calibrated before initial use. See "Touchscreen Calibration" in Chapter 4, "System Configuration".

Note: Always use the point of the stylus for tapping or making strokes on the display. Never use an actual pen, pencil or sharp object to write on the touchscreen.

The touchscreen input performs the same function as the mouse that is used to point to and click elements on a desk top computer. A stylus is used in the same manner as a mouse – single tap or double tap to select menu options, drag the stylus across text to select, hold the stylus down to activate slider bars, etcetera. Right click is accomplished via a tap and hold on the touchscreen.

Hold the stylus as if it were a pen or pencil. Touch an element on the screen with the tip of the stylus then remove the stylus from the screen. The touchscreen responds to an actuation force (touch) of up to 4 oz. of pressure.

The touchscreen can be used in conjunction with the keyboard and scanner and an input/output device connected to one of the VX7's serial ports.

- Touch the stylus to the field of the data entry form to receive the next data feed.
- The cursor begins to flash in the field.
- The unit is ready to accept data from either the keyboard, integrated scanner or a device connected to a serial port.

Note: The touchscreen may be disabled. Please refer to "Disabling the Touchscreen" in Chapter 4, "System Configuration" for details.

Right Click

A right click can be simulated on the touchscreen. To perform a right click, touch the touchscreen with the stylus and hold it in the same location for a short time.

Note: Some applications may not support this right click method. Please review documentation for the application to see if it provides for right mouse click configuration.

Input Panel (Virtual Keyboard)

Data may be entered via the input panel (virtual keyboard) on the touchscreen. For more details on the input panel, please refer to Chapter 2, "Physical Description and Layout".

Touchscreen and Mouse

The behavior of the mouse pointer on the touchscreen varies by VX7 construction.

To identify your VX7 platform type, please see “Identifying Your VX7”, in Chapter 2, “Physical Description.

Platform 1 VX7’s

Because the touchscreen also functions as a mouse, the pointer for on the 95-key keyboard, a USB mouse or a PS/2 mouse pointer may not always be visible on the screen. The mouse pointer reappears when the 95-key keyboard pointer or external mouse is moved or clicked. Please see “USB Mouse” earlier in this manual for more details.

- When a USB mouse is first attached to the VX7, the mouse pointer may not be visible. However, moving or clicking the mouse causes the pointer to appear.
- When the USB mouse is unplugged, the pointer may remain visible until the touchscreen is tapped.
- If the touchscreen is used for input, the mouse pointer may disappear. However, moving or clicking the mouse or pointing device on the 95-key keyboard causes the pointer to reappear.

Platform 2 VX7’s

The mouse pointer is not visible unless a mouse (P/S2 or USB mouse or 95-key keyboard with pointing device) is attached.

If a mouse of any kind is attached, the mouse pointer is displayed on screen.

ActiveSync – Initial Setup

The following instructions relate to initial setup of ActiveSync. When there is a Connect icon on the VX7 desktop, this section can be bypassed.

USB Connection

The VX7 is configured to use USB-C by default. No configuration is necessary

Connect the cable to the PC (the host) and to the dongle cable on the VX7 (the client). The ActiveSync connection is established automatically when the cable is connected.

Cables for USB ActiveSync Connection:

USB Client to PC/Laptop	Dongle cable w/USB-C connector	9000A075CBLUSBHCETH
	Also requires a standard USB cable with a type A plug on one end, and a type B plug on the other.	

Serial Connection

Select **Start | Settings | Control Panel | PC Connection**. Click the Change button. From the popup list, choose the appropriate COM port and baud rate.

This will set up the VX7 to use the USB or designated COM port. Click OK and ensure the check box for "Allow connection with desktop computer when device is attached" is checked.

Click OK to return to the Control Panel.

Note: By default COM3 (labeled "COM2/3") is configured to use ActiveSync (Pin 9 = RI). Please refer to "Serial Port Pin 9" in Chapter 4, "System Configuration" fore details on configuring Pin 9 of the serial ports.

Connect

Connect the correct cable to the PC (the host) and the VX7 (the client). Select "Connect" from the Start Menu on the VX7 (**Start | Programs | Communications | Connect**).

Note: Run "Connect" when the "Get Connected" wizard on the host PC is checking COM ports to establish a connection for the first time.

Cable for Serial ActiveSync Connection:

Serial Client to PC/Laptop	RS-232 9 Pin to 9 Pin	9000A054CBL6D9D9

Radio

Note: You must establish a partnership with a desktop computer prior to running ActiveSync on the VX7. The initial partnership must be done using direct serial / USB cable connection.

Once the relationship is established using the serial port, the ActiveSync link in the Start Menu gives a choice of connections, one of which is radio.

Select **Start | Settings | Programs | Communication | ActiveSync**. From the popup list, choose Network and then click the Connect button.

Getting Help

All LXE manuals are now available on one CD and they can also be viewed/downloaded from the LXE website. Contact your LXE representative to obtain the LXE Manuals CD.

You can also get help from LXE by calling the telephone numbers listed on the LXE Manuals CD, in the file titled "Contacting LXE". This information is also available on the LXE website www.lxe.com.

Explanations of terms and acronyms used in this guide are located in the file titled "Glossary" on the LXE Manuals CD.

Manuals and Accessories

Manuals

The following manuals are available on the LXE Manuals CD:

- VX7 User's Guide
- RFTerm™ Reference Guide
- Contacting LXE
- LXE Technical Glossary

Accessories

The table below lists the available VX7 accessories. Where two parts numbers are listed for a given part, the part number ending in "-R" is the RoHS compliant version.

VX7 Brackets	
Bracket, U Style, VX6 VX7	9000A021UBRACKET 9000A021UBRACKET-R
Bracket, U Style w/ Integrated Keyboard Mount, VX7	9000A025UBRKTWKBDMNT 9000A025UBRKTWKBDMNT-R
Kit, VXX U-Bracket to VX6 VX7 Adapter	9000A022BRKTADPTKIT 9000A022BRKTADPTKIT-R
Kit, VXX U-Bracket to VX7 Adapter w/ Keyboard Mount	9000A026BRKTADPKBDMN 9000A026BRKTADPKBDMN-R
Bracket, RAM Mount VX6 VX7	9000A023BRKTRAMMOUNT 9000A023BRKTRAMMOUNT-R
Bracket, Combo RAM VMT Mount w/ Keyboard Mount, VX7	9000A027BRKTRAMWKBMN 9000A027BRKTRAMWKBMN-R
Bracket, VXX RAM ball on plate	9000A028RAMPLATEBALL 9000A028RAMPLATEBALL-R
Bracket, RAM keyboard mounting plate	9000A029RAMKBDPLATE 9000A029RAMKBDPLATE-R
Bracket, RAM keyboard arm	9000A030RAMKBDARM 9000A030RAMKBDARM-R
Bracket, RAM Squeeze Mount, VX6 VX7	9000A031BRKTRAMSQZMT 9000A031BRKTRAMSQZMT-R
Bracket, Combo RAM Squeeze Mount w/Keyboard Mount	9000A032BKTRAMSQKBMT 9000A032BRKTRAMSQKBMT-R

Keyboard Brackets	
Bracket, Remote, Keyboard, LXE	9000A012BRKTRMTLXE 9000A201BRKTRMTLXE-R
Bracket, Remote, Mouse Keyboard	9000A018BRKTMKBDRMT 9000A018BRKTMKBDRMT-R
Keyboards	
Keyboard, LXE Standard, D9, ANSI/PC Overlay, QWERTY	9000A157KBDSTDD9ANSI 9000A157KBDSTDD9ANSI-R
Keyboard, LXE Standard, D9, 5250 Overlay, QWERTY	9000A158KBDSTDD95250 9000A158KBDSTDD95250-R
Keyboard, LXE Standard, D9, 3270 Overlay, QWERTY	9000A159KBDSTDD93270 9000A159KBDSTDD93270-R
Keyboard, Rugged PC Style w/Mouse, PS2 D9	9000A160MOUSEKBDD9 9000A160MOUSEKBDD9-R
Data Cables	
Cable, Combo D15 to USB and Ethernet Adapter 1 Ft	9000A071CBLD15USBETH (above part is RoHS compliant)
Cable, Combo D15 to USB-H, USB-C and Ethernet Adapter	9000A075CBLUSBHCETH (above part is RoHS compliant)
Cable, Keyboard/Mouse Dual PS2 Adapter 1 Ft	9000A072CBLD9DUALPS2 (above part is RoHS compliant)
Cable, Printer/PC, D9 to D25	9000A053CBL6D9D25 (above part is ***not*** RoHS compliant)
Cable, PC, D9 to D9	9000A054CBL6D9D9 (above part is RoHS compliant)
Power Cables	
Cable, Input Power, 12 FT, VX5 VX6 VX7	9000A073CBLPWR12FT 9000A037CBLPWR12FT-R
Adapter Cable, VX1 VX2 VX4 Power Cable to VX5 VX6 VX7	9000A077CBLPWRADPTR (above part is RoHS compliant)
Power Supplies	
Power Supply, External, AC, W/US Power Cord VX5 VX6 VX7	9000A317PSACUS 9000A318PSACUS-R
Power Supply, External, AC, No Power Cord VX5 VX6 VX7	9000A318PSACWW 9000A318PSACWW-R
UPS Battery and Cables	
Battery, UPS Lead Acid, VX5 VX6 VX7	9000A378UPSBATTPACK 9000A378UPSBATTPACK-R
Cable, UPS Battery, Remote Mount Extender, 6 Ft	9000A074CBLUPSEXTNDR (above part is RoHS compliant)

Antenna and Antenna Mount Kits	
Replacement antenna, 2.4GHz	153180-0001 (above part is RoHS compliant)
Remote Mount Antenna Assembly Kit, 8 Ft Cable	9000A279ANTREMOTE8 9000A279ANTREMOTE8-R
Remote Mount Antenna Assembly Kit, 6 Ft Cable	9000A278ANTREMOTE6 9000A278ANTREMOTE6-R
Right Angle Remote Mount Antenna Assembly Kit, 6 Ft Cable	9000A280ANTREMOTE6RT (above part is RoHS compliant)
Right Angle Remote Mount Antenna Assembly Kit, 15 Ft Cable	9000A281ANTREMOT15RT (above part is RoHS compliant)
Miscellaneous	
Stylus, with Tethers and Sleeves, 5 Pack	9000A510STYLUS (above part is RoHS compliant)
Protective Film, 12 in Display, 10 Pack, VX5 VX7	9000A511PROTFILM12IN (above part is RoHS compliant)
Scanners	
Scanner, Powerscan, SR, 8’ Cbl, WW	8300A326SCNRPWRSR8DA9F 8300A326SCNRPWRSR8DA9F-R
Scanner, Powerscan, SR, 12’ Cbl, US	8300A327SCNRPWRSR12DA9F (above part is ***not*** RoHS compliant)
Scanner, Powerscan, SR, Low Temp, 8’ Cbl	8300A332SCNRS8D9FLT (above part is ***not*** RoHS compliant)
Scanner, Powerscan, SR, Low Temp, 12’ Cbl	8300A333SCNRS12D9FLT (above part is ***not*** RoHS compliant)
Scanner, Powerscan, LR, 8’ Cbl, WW	8310A326SCNRPWRLR8DA9F 8310A326SCNRPWRLR8DA9F-R
Scanner, Powerscan, LR, 12’ Cbl, US	8310A327SCNRPWRLR12DA9F 8310A327SCNRPWRLR12DA9F-R
Scanner, Powerscan, LR, Low Temp, 8’ Cbl	8310A332SCNRL8D9FLT (above part is ***not*** RoHS compliant)
Scanner, Powerscan, LR, Low Temp, 12’ Cbl	8310A333SCNRL12D9FLT (above part is ***not*** RoHS compliant)
Scanner, Powerscan, XLR, 8’ Cbl, WW	8320A326SCNRPWRXLR8DA9F 8320A326SCNRPWRXLR8DA9F-R
Scanner, Powerscan, XLR, 12’ Cbl, US	8320A327SCNRPWRXLR12DA9F (above part is ***not*** RoHS compliant)
Scanner, Powerscan, XLR, Low Temp, 8’ Cbl	8320A332SCNRX8D9FLT (above part is ***not*** RoHS compliant)
Scanner, Powerscan, XLR, Low Temp, 12’ Cbl	8320A333SCNRX12D9FLT (above part is ***not*** RoHS compliant)
Scanner, LS3408 Fuzzy Logic SR, D9 Interface Cable, 8ft	8510A326SCNRFZYDA9F 8510A326SCNRFZYDA9F-R
Scanner, LS3408 Extended Range, D9 Interface Cable, 8ft	8520A326SCNRERDA9F 8520A326SCNRERDA9F-R

Chapter 2 Physical Description and Layout

Identifying Your VX7

Some features discussed in this document may not be available for all VX7's. Additionally, some features require a certain revision level of system software.

Any feature that is not identified as platform specific or requiring a certain level of system software is available to all VX7's.

Hardware Platforms

To determine the platform level of your VX7, please refer to the VX7 serial number decal.

Platform 1 VX7

VX7's identified as Platform 1 by a P1 notation on the serial number decal (and VX7's with no platform identification on the serial number decal) are referred to as Platform 1 VX7's. These VX7's DO NOT support the features identified as "Platform 2" throughout this manual.

Note: If software revision 1ED or greater is installed, "LXE VX7 Platform 1" is displayed during boot up. See "Software Revisions", below, to determine the software revision installed on the VX7. If no software revision is displayed during bootup, the VX7 is a Platform 1 type as all Platform 2 VX7's ship with software revision 1ED or greater.

Platform 2 VX7

VX7's identified as Platform 2 by a P2 notation on the serial number decal support all features, including those noted as Platform 2 specific.

Note: If software revision 1ED or greater is installed, "LXE VX7 Platform 2" is displayed during boot up. See "Software Revisions", below, to determine the software revision installed on the VX7.

Software Revisions

Some features described in this manual require a certain minimum revision level of system software. These features are available on all VX7's if the proper revision level (or newer) of system software is installed.

The software revision is displayed during boot up and on the default desktop wallpaper. The revision can also be viewed using the **Start | Settings | Control Panel | About** icon. For more information, please refer to Chapter 4, "System Configuration".

To upgrade the VX7 with a newer revision of system software, please refer to "Reflash the VX7" in Chapter 4, "System Configuration".

Hardware Configuration

System Hardware

The VX7 hardware configuration is shown in the following figure.

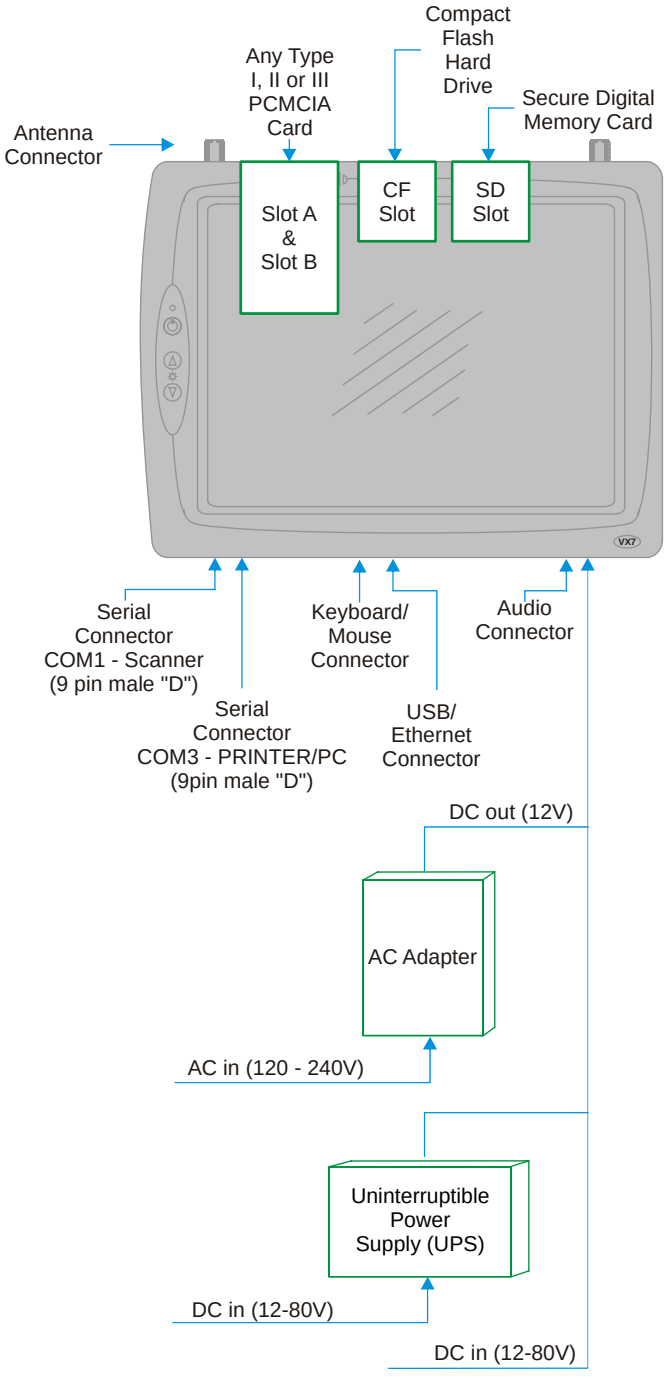

Compact Flash Hard Drive
Any Type I, II or III PCMCIA Card
Secure Digital Memory Card
Antenna Connector
Slot A & Slot B
CF Slot
SD Slot
Serial Connector COM1 - Scanner (9 pin male "D")
Serial Connector COM3 - PRINTER/PC (9pin male "D")
Keyboard/ Mouse Connector
USB/ Ethernet Connector
Audio Connector
DC out (12V)
AC Adapter
AC in (120 - 240V)
Uninterruptible Power Supply (UPS)
DC in (12-80V)
DC in (12-80V)

Figure 2-1 VX7 Hardware Configuration

Central Processing Unit

The LXE VX7 contains an 400MHz Intel PXA255 CPU.

I/O Components

The VX7 supports the following I/O components:

- Two 9-pin RS-232 serial ports configured as:
  - COM1
  - COM3 (labeled "COM2/3")

  Note: There is no COM2 port on the VX7.
- Two PCMCIA slots (supporting Type I or II PCMCIA cards).
- One slot for SD memory card.
- Compact flash drive.
- LXE VMT or standard PS/2 keyboard (via a watertight connector).
- Ports available via dongle cable:
  - USB Host port
  - USB Client Port
  - Ethernet port
- One audio jack providing monaural audio output.

System Memory

Main system memory is 64 or 128MB DRAM.

Video Subsystem

The LXE VX7 video subsystem consists of a color TFT display. The video subsystem complies with the VESA VL bus standard.

The display supports screen blanking to eliminate driver distraction when the vehicle is in motion. Please see "Technical Specifications – Screen Blanking Cable" later in this chapter and "Screen Blanking" in Chapter 4, System Configuration" for details.

To identify your VX7 platform type, please see "Identifying Your VX7", earlier in this chapter.

Platform 1 VX7's

The display resolution is 800 x 600 pixels. This resolution complies with the SVGA graphics industry standard.

Platform 2 VX7's

The default resolution of this display is 800 by 600 pixels. This resolution complies with the SVGA graphics industry standard. The display can also be configured for 640 by 480 pixels.

To change the display resolution, please refer to "Changing the Display Resolution" in Chapter 4, "System Configuration".

Power Supply

Vehicle power input for the VX7 is 12V to 80V DC nominal and is accepted without the need to perform any manual operation within the VX7.

If 12V to 60V DC power is not available – for example, in an office environment – an optional external Universal Input Power Supply can be used to convert AC wall power to an appropriate DC level. See Chapter 3 “Power Supply”, sub-section titled “External Power Supply”.

Power input is fused for protection and the fuse is externally accessible.

Uninterruptible Power Supply

A DC uninterruptible power supply (UPS) battery is available to maintain power to the VX7 for a minimum of 15 minutes when vehicle power is not available (such as when a vehicle battery is being swapped).

Backup Battery

The LXE VX7 has a permanent lithium battery installed to maintain time and date. The backup battery is not user serviceable and should last five years with normal use before it requires replacement.

Note: This battery should only be changed by authorized service personnel.

PCMCIA Slots

Microsoft Windows CE .NET Plug and Play operating system controls the PCMCIA cards. These cards are hot swappable per the PCMCIA specifications.

CF Slot

The CF ATA slot is not hot swappable. The VX7 must be powered down to insert or remove an ATA card. Since the operating system is stored on the ATA card, the VX7 cannot operate without the ATA card.

SD Slot

The SD slot accepts an SD memory card. These cards are hot swappable.

Physical Controls

On/Off Switch

The power (on/off) switch is a push button switch located on the front control panel of the VX7. The switch is a momentary switch. If the VX7 is Off, pressing the power switch turns the VX7 On.

For Platform 2 VX7's, the keyboard LEDs turn on for about one second when the operating system loads the keyboard driver. If the LEDs blink more than once, this indicates a keyboard problem.

- On a USB or PS/2 keyboard, the NumLock, CapsLock and Scroll Lock keys blink the same as a desktop PC.
- On the 95-key keyboard, the CapsLock, NumLock and Scroll Lock keys are backlit amber. However, the keyboard backlight must be On for this feature to be used. The brief illumination may not be visible unless the room is dark.
- On the 60-key keyboard, only the CAPs led is lit during this process.

To identify your VX7 platform type, please see "Identifying Your VX7", earlier in this chapter.

If the VX7 is On, pressing and releasing the power switch turns the VX7 Off. An orderly shutdown is preformed. Any open programs are closed, the Windows CE .NET operating system shuts down and then the VX7 powers off.

If a software lockup should occur and the VX7 is unresponsive to keyboard or touchscreen input, pressing and holding the power button for several seconds forces a shutdown. However, the forced shutdown is not an orderly shutdown. All unsaved data and any registry settings not saved to persistent storage are lost.

The Status LED, located on the keyboard of the VX7, is lit when the power is on:

- **Green** – VX7 is operating from vehicle power or AC power.
- **Solid Yellow** – VX7 is operating from the UPS, UPS battery is good.
- **Flashing Yellow** – VX7 is operating from the UPS, UPS battery is critically low.

Note: Always turn the computer off prior to removing power cables.

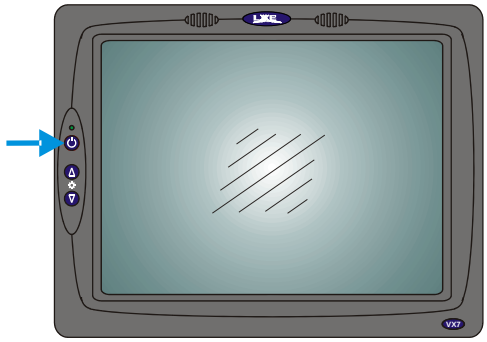


Figure 2-2 The Power (On/Off) Switch

Caution	**The VX7 has voltage on it even when power is off. Always disconnect input power before working on the VX7 (changing fuse, opening access panel, etc).**

External Connectors

Most external connectors for the VX7 are located on the bottom of the unit.

- The Keyboard/Mouse connector accepts an LXE VMT keyboard or a dongle cable for a PS/2 keyboard and mouse.
- COM1 connects to a serial barcode scanner.
- COM3 (labeled "COM2/3") connects to a serial printer or PC with the appropriate cables.
- The USB/Ethernet connector accepts dongle cables, offering a combination of the following ports:
  - An Ethernet port
  - A USB Host port
  - A USB Client port
- Audio connects to a mono or stereo telephone headset/microphone.

Other external connectors are located as follows:

- Antenna connectors are located on the top of the VX7. VX7's can be configured for a single antenna or dual antennas.

Scanner Serial Connector (COM1)

The serial connector, labeled "SCANNER", (configured as COM1) is industry-standard RS-232. The connector includes a PC/AT standard 9–pin "D" male connector. By default, Pin 9 is configured to supply +5 VDC at 0.4A (max) for an external bar code scanner. Pin 9 may also be configured to provide RI. Refer to Chapter 4, "System Configuration", section titled "Serial Port Pin 9" for more information on configuring Pin 9.

If Pin 9 is powered off, please see "Technical Specifications – Connection Cable" in the following section for information on using a serial cable.

If COM1 is not being used for a scanner, it can also be used for screen blanking when the vehicle is in motion. Please see "Technical Specifications – Screen Blanking Cable" in the following section for more details.

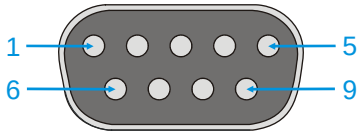


Figure 2-3 Scanner Serial Connector (COM1)

Note: Power the VX7 off before attaching a cable or device to the COM1 serial port.

Pinout

Pin	Signal	Description
1	DCD	Data Carrier Detect – Input
2	RXD	Receive Data – Input
3	TXD	Transmit Data – Output
4	DTR	Data Terminal Ready – Output
5	GND	Signal/Power Ground
6	DSR	Data Set Ready – Input
7	RTS	Request to Send – Output
8	CTS	Clear to Send – Input
9	+5VDC or RI	Barcode Scanner Power – 400mA max (Default) or Ring Indicator – Input
Shell	CGND	Chassis Ground

Printer/PC Serial Connector (COM3)

The serial connector (labeled "COM2/3") is an industry-standard RS-232 9-pin "D" connector. The connector and its pin assignments are shown below. By default, Pin 9 provides RI. Pin 9 may also be configured to supply +5 VDC at 0.4A (max) for an external bar code scanner. Refer to Chapter 4, "System Configuration", section titled "Serial Port Pin 9" for more information on configuring Pin 9.

Please see "Technical Specifications – Connection Cable" below for information on using a serial cable.

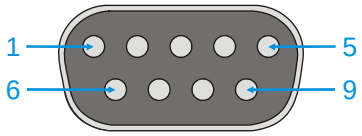


Figure 2-4 Printer/PC Serial Connector (COM3)

Note: Power the VX7 off before attaching a cable or device to the COM3 serial port.

Pinout

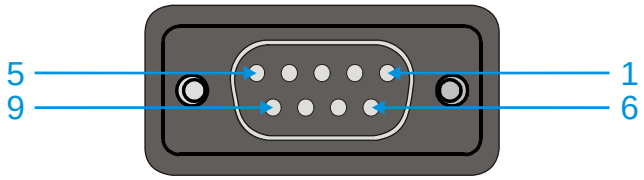
Pin	Signal	Description
1	DCD	Data Carrier Detect – Input
2	RXD	Receive Data – Input
3	TXD	Transmit Data – Output
4	DTR	Data Terminal Ready – Output
5	GND	Signal/Power Ground
6	DSR	Data Set Ready – Input
7	RTS	Request to Send – Output
8	CTS	Clear to Send – Input
9	RI or +5VDC	Ring Indicator – Input (default) or Bar Code Scanner Power – 400mA max
Shell	CGND	Chassis Ground

Technical Specifications – Connection Cable

The exact serial cable is crucial. Many commercial null modem cables will not work. LXE recommends the following cable:

Serial cable:

9000A054CBL6D9D9



Pinout:

DB9 female	DB9 female
1	7
2	3
3	2
4	6, 8
5	5
6, 8	4
7	1
9	no connection

Figure 2-5 Pinout – Serial Cable

Some laptop devices do not properly implement all control lines on the serial port – the laptop connection will not work.

RTS/CTS Handshaking and the Serial Port

RTS	Ready to Send	CTS	Clear to Send
DTR	Data Terminal Ready	DSR	Data Set Ready
Remote Side	The device sending data to and receiving data from the VX7 through the LXE serial cable connected to the RS-232 ports on both devices.		
LXE Serial Cable	9000A054CBLD9D9		

The VX7 serial port supports four types of handshaking via the LXE serial cable: None, standard Xon/Xoff, standard DTR/DSR, and a form of RTS/CTS.

To use RTS/CTS, the remote side computer must clear the DTR line which sets the VX7 CTS line and allows the VX7 to send data to the remote side.

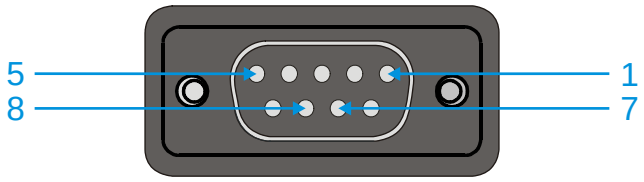
This allows signals and data to travel smoothly between both devices.

Technical Specifications – Screen Blanking Cable

The customer must supply their own cable. The cable must be designed so that pin 7 (RTS – Request to Send Output) and pin 8 (Clear to Send Input) of a D9 female connector provide continuity only when the vehicle is stopped (for example, via a switch on the accelerator pedal of the fork truck). All other pins on the connector must be left unconnected. If pins 7 and 8 do not provide continuity (or the cable is removed), the VX7 screen remains blank.

Serial cable:

Customer built cable with the following specifications:



Pinout:

DB9 female	Function
1	Not Used
2	Not Used
3	Not Used
4	Not Used
5	Not Used
6	Not Used
7	No signal when in motion, Continuity to Pin 8 when stopped
8	No signal when in motion, Continuity to Pin 7 when stopped
9	Not Used

Figure 2-6 Pinout – Screen Blanking Cable

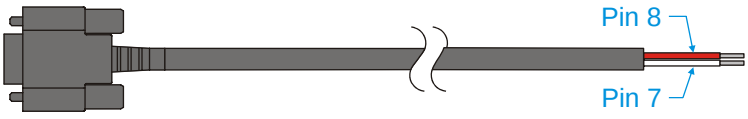


Figure 2-7 Sample Cable for Screen Blanking

Please refer to “Scanner” in Chapter 4, “System Configuration”, for the proper COM port settings to support screen blanking.

Keyboard/Mouse Connector

The VX7 external keyboard connector accepts:

- An LXE VMT keyboard with integrated pointing device
- An LXE VMT keyboard without integrated pointing device
- A dongle cable providing PS/2 connections for a standard PS/2 keyboard and mouse.

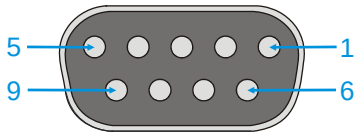


Figure 2-8 VX7 Keyboard Connector and External Keyboard Cable Connector

The +5V supply available from the connector is current limited at 400mA.

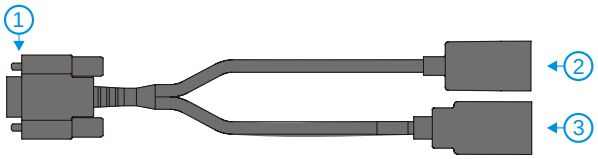
Note: Power the VX7 off before attaching a cable or device to the Keyboard/Mouse connector.

Pinout

Pin	Signal	Description
1	KBDAT_A	Keyboard Data
2	MSDAT_A	Mouse Data
3	–	Not Connected
4	MSCLK_A	Mouse Clock
5	DGND	System Ground
6	–	Not Connected
7	KBCLK_A	Keyboard Clock
8	/BL_ENABLE	Keyboard Backlight Enable
9	KDB_PWR	Keyboard Power, 5V
Shell	CGND	Chassis Ground

PS/2 Keyboard/Mouse Dongle Cable

The PS/2 keyboard/mouse dongle cable allows a standard PS/2 keyboard and/or mouse to be attached to the VX7. The PS/2 connectors on the dongle cable are labeled for keyboard and mouse.



1 D9 Connector

2 PS/2 Keyboard Connector

3 PS/2 Mouse Connector

Figure 2-9 VX7 PS/2 Keyboard/Mouse Dongle Cable

Note: Power the VX7 off before attaching the cable to the Keyboard/Mouse connector. The VX7 must also be powered off to add or remove a PS/2 keyboard or mouse.

D9 Male Connector

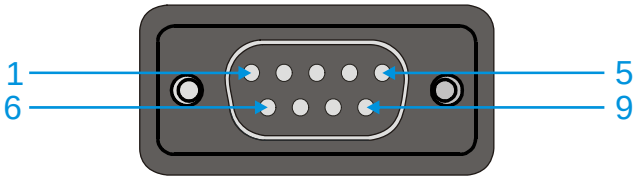


Figure 2-10 D9 Male Connector

Pinout

Pin	Signal	Description
1	KBDAT_A	Keyboard Data
2	MSDAT_A	Mouse Data
3	–	Not Connected
4	MSCLK_A	Mouse Clock
5	DGND	System Ground
6	–	Not Connected
7	KBCLK_A	Keyboard Clock
8	/BL_ENABLE	Keyboard Backlight Enable
9	KB_PWR	Keyboard Power, 5V
Shell	CGND	Chassis Ground

PS/2 Keyboard Connector

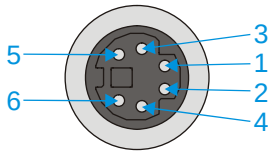


Figure 2-11 PS/2 Keyboard Connector

Pinout

Pin	Signal	Description
1	KBDAT_A	Keyboard Data
2	–	Not Connected
3	DGND	System Ground
4	KBD_PWR	Keyboard Power, 5V
5	KBCLK_A	Keyboard Clock
6	–	Not Connected
Shell	CGND	Chassis Ground

PS/2 Mouse

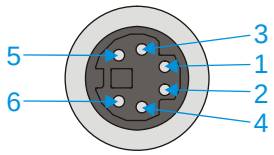


Figure 2-12 PS/2 Mouse Connector

Pinout

Pin	Signal	Description
1	MSDAT_A	Mouse Data
2	–	Not Connected
3	DGND	System Ground
4	KBD_PWR	Keyboard Power, 5V
5	MSCLK_A	Mouse Clock
6	–	Not Connected
Shell	CGND	Chassis Ground

Ethernet/USB Connector

The VX7 Ethernet/USB connector accepts dongle cables that provide combinations of the following connections:

- an Ethernet port, via an RJ45 connector
- a USB Host port for connecting a USB device to the VX7
- a USB Client port to connect the VX7 to a USB host or hub.

Note: Please refer to the diagrams later in this chapter for details on available ports with the dongle cable options.

The connector is shown below.

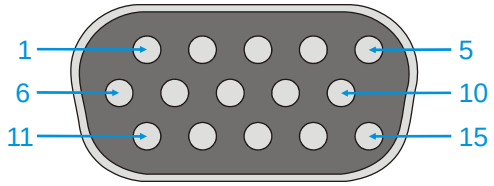


Figure 2-13 VX7 USB Connector and External USB Adapter Cable Connector

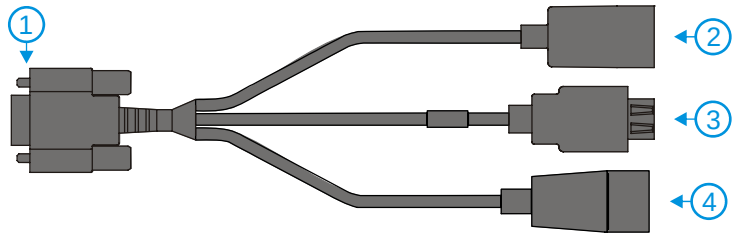
Note: Power the VX7 off before attaching a cable or device to the Ethernet/USB connector.

Pinout

Pin	Signal	Description
1	USB2N_A	USB D –
2	–	Not Connected
3	–	Not Connected
4	RXP	Receive +
5	RXN	Receive –
6	USB2P_A	USB D +
7	DGND	USB Power Return
8	–	Not Connected
9	RJ45_45	RJ45, Pins 4 and 5 Connections
10	RJ45_78	RJ45, Pins 7 and 8 Connections
11	5V_USB_23	USB Power, Current Limited
12	–	Not Connected
13	–	Not Connected
14	TXN	Transmit –
15	TXP	Transmit +
Shell	CGND	Chassis Ground

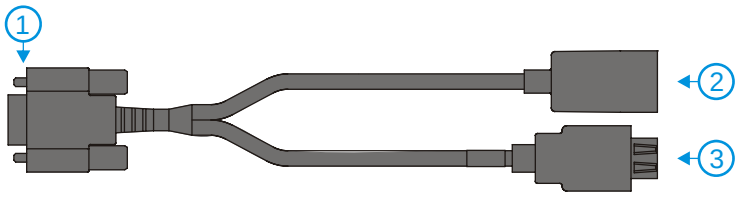
Ethernet/USB Dongle Cables

The available dongle cables are shown below.



1 D15 Connector
2 RJ45 Connector
3 USB Host Connector
4 USB Client Connector

9000A075CBLUSBHCETH



1 D15 Connector
2 RJ45 Connector
3 USB Host Connector

9000A071CBLD15USBETH

Figure 2-14 VX7 Ethernet/USB Dongle Cables

Note: Power the VX7 off before attaching a cable or device to the Ethernet/USB connector.

The connectors and pinouts for the dongle cables are detailed below.

⚠	9000A075CBLUSBHCETH is required when using ActiveSync via USB on the VX7.

D15 Female Connector

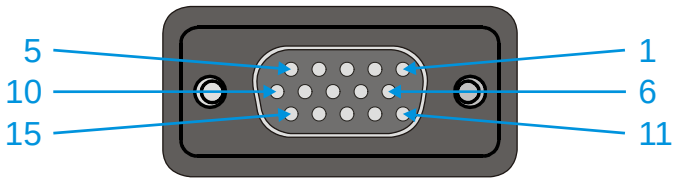


Figure 2-15 D15 Female Connector

Pinout

Pin	Signal	Description
1	USB2N_A	USB-H D –
2	–	Not Connected
3		USB-D Power
4	RXP	Receive +
5	RXN	Receive –
6	USB2P_A	USB-H D +
7	DGND	USB-H Power Return
8		USB-D D –
9	RJ45_45	RJ45, Pins 4 and 5 Connections
10	RJ45_78	RJ45, Pins 7 and 8 Connections
11	5V_USB_23	USB-H Power, Current Limited
12		USB-D Power Return
13		USB-D D +
14	TXN	Transmit –
15	TXP	Transmit +
Shell	CGND	Chassis Ground

USB Host Connector

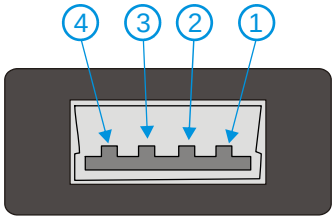


Figure 2-16 Dongle Cable USB Host Port

Pinout

Pin	Signal	Description
1	5V_USB_23	USB Power, Current Limited
2	USB2N_A	USB D –
3	USB2P_A	USB D +
4	DGND	USB Power Return
Shell	CGND	Chassis Ground

USB Client Connector

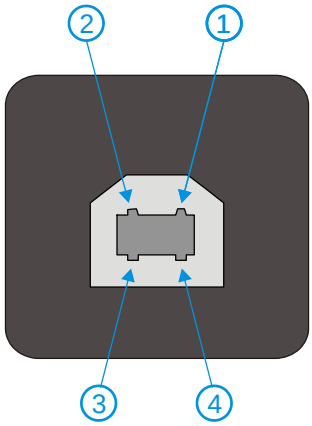


Figure 2-17 Dongle Cable USB Client Port

Pinout

Pin	Signal	Description
1	5V_USB_23	USB Power, Current Limited
2	USB2N_A	USB D –
3	USB2P_A	USB D +
4	DGND	USB Power Return

RJ45 Connector

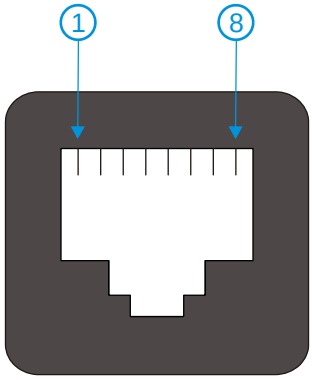


Figure 2-18 Dongle Cable Ethernet Port

Pinout

Pin	Signal	Description
1	TXP	Transmit +
2	TXN	Transmit –
3	RXP	Receive +
4	–	Not Connected
5	–	Not Connected
6	RXN	Receive –
7	–	Not Connected
8	–	Not Connected

Audio Connector

The VX7 audio connector accepts a headset with a 2.5mm plug, such as a mono telephone headset with microphone or a stereo headset.

Please refer to “Mixer” in Chapter 4, “System Configuration” for information on configuring the audio port for either a mono headset with microphone or a stereo headset.

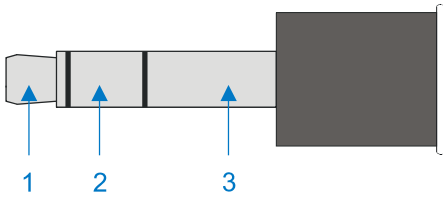


Figure 2-19 VX7 Audio Jack for External Speaker or Headphones

Note: The VX7 is not configured for standard PC speakers.

Pinout

Pin	Description
1	Microphone (Not connected in VX7)
2	Speaker
3	Ground

Power Supply Connector

Power is supplied to the VX7 through the power connector. Additionally this assembly provides a connection point for the vehicle's chassis ground to be connected internally to the conductive chassis of the computer.

The VX7 internal power supply can accept DC input voltages in the range of 12 to 80 Volts.

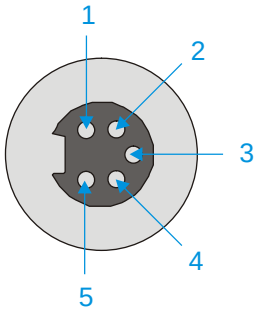


Figure 2-20 The Power Connector

Pinout

Pin	Signal
1	DC Positive (+)
2	UPS Battery Positive (+)
3	Chassis Ground
4	UPS Battery Negative (–)
5	DC Negative (–)

UPS Battery Pack Connectors

Input

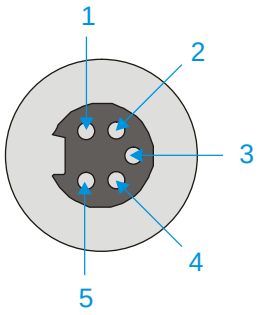


Figure 2-21 The UPS Battery Pack Input Connector

Pinout

Pin	Signal
1	DC Positive (+)
2	Not used
3	Chassis Ground
4	Not used
5	DC Negative (–)

Output

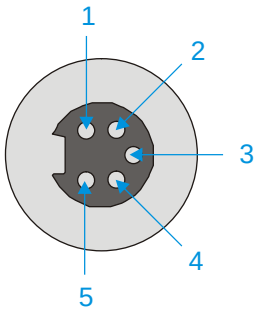


Figure 2-22 The UPS Battery Pack Output Connector

Pinout

Pin	Signal
1	DC Positive (+)
2	UPS Battery Positive (+)
3	Chassis Ground
4	UPS Battery Negative (–)
5	DC Negative (–)

UPS Battery Extension Cable Connectors

Input

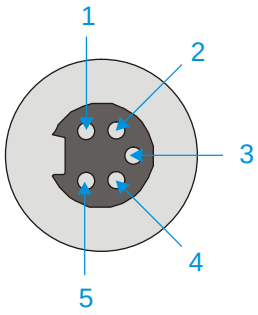


Figure 2-23 The UPS Battery Extension Cable Input Connector

Pinout

Pin	Signal
1	DC Positive (+)
2	UPS Battery Positive (+)
3	Chassis Ground
4	UPS Battery Negative (–)
5	DC Negative (–)

Output

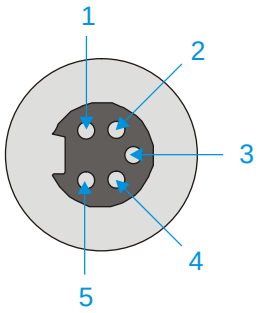


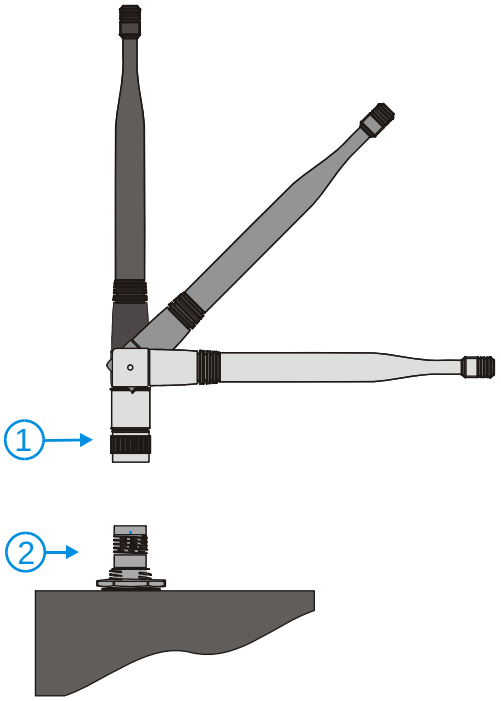
Figure 2-24 The UPS Battery Extension Cable Output Connector

Pinout

Pin	Signal
1	DC Positive (+)
2	UPS Battery Positive (+)
3	Chassis Ground
4	UPS Battery Negative (–)
5	DC Negative (–)

Antenna Connections

Note: VX7's are equipped with a radio and require an either an external or an internal antenna. Some VX7's may be equipped with a dual antenna option. For these VX7's, an external antenna must be connected to each antenna connector.



1. Antenna
2. Antenna Connector

Figure 2-25 2.4GHz External Antenna

Spread Spectrum RF Antenna Connector Pin

VX7's ordered with an external antenna option have either one or two antenna connectors located on top of the unit. VX7's ordered with the internal antenna option do not have an external antenna connector.

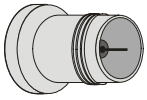


Figure 2-26 RF Antenna SS Connector

Vehicle Remote Antenna Mount

The external antenna (or antennas) can be remotely mounted on the vehicle. Please refer to the "Vehicle Remote Mount Antenna Installation Sheet" for details.

Internal Antenna

If the internal antenna option is ordered, an antenna is mounted on the inside of the user access panel cover.

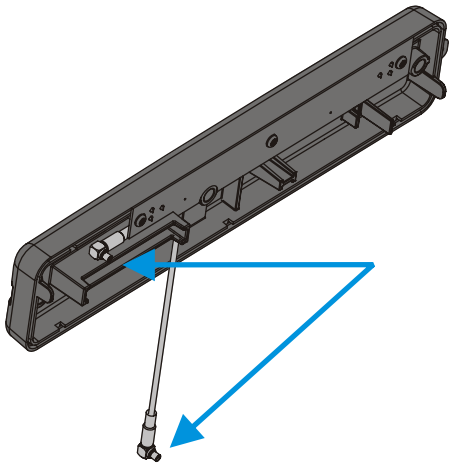


Figure 2-27 Internal Antenna Cables

The internal antenna assembly has two antenna cables which are attached to the radio card.

The Keyboards

The following keyboard options are available for the VX7:

The LXE VMT keyboards are customized rugged keyboards, connected to the VX7 via a watertight connector. The keyboards are available in the following configurations:

- LXE VMT 95-key QWERTY keyboard with integrated pointing device – a customized rugged keyboard connected to the VX7 via a watertight connector.
- LXE VMT 60-key QWERTY keyboard – a customized rugged keyboard connected to the VX7 via a watertight connector
- A standard PS/2 keyboard via an adapter cable attached to the "Keyboard/Mouse" port on the VX7. The adapter cable also provides a connector for a PS/2 mouse.
- A USB keyboard via a dongle cable attached to the "Ethernet/USB" connector.
- A software keyboard, or virtual keyboard, can be displayed on the touchscreen. The virtual keyboard can be used in place of, or in addition to, a physical keyboard.

For more details on each keyboard type, please refer to the appropriate section later in this chapter.

95 key with Integrated Pointing Device

60 key

Figure 2-28 The LXE VMT Keyboards with Cable

The 95-key QWERTY Keyboard with Pointing Device

Designed for ease of use with the Windows CE .NET operating system, the 95-key keyboard with pointing device connects via a cable to the keyboard port on the VX7. Additional Windows keys (the Windows logo key and the Application key) and an integrated pointing device are provided.

Figure 2-29 The 95-key QWERTY Keyboard

Key Maps

The 95-key keyboard supports all 104 keyboard functions (101 keyboard standard plus Windows keys) and includes an integrated pointing device and left and right mouse buttons. However, because the keyboard only has 95 keys, all functions are not visible (or printed on the keyboard). Therefore the VX7 keyboard supports what is called hidden keys -- keys that are accessible but not visible on the keyboard.

Note: The 95-key keyboard does not have a 2nd key function.

NumLock and the VX7

For the 95-key keyboard, the NumLock key and the numeric keys are backlit **green** when NumLock is off. When NumLock is on, the backlight for the NumLock key and the numeric keys is **amber**.

For information on preserving NumLock configuration after a reboot, please see “Configuring NumLock Behavior” in Chapter 4, “System Configuration”.

CapsLock and the VX7

For the 95-key keyboard, the CapsLock key is backlit **green** when CapsLock is off. When CapsLock is on, the backlight for the CapsLock key is **amber**.

For information on preserving CapsLock configuration after a reboot, please see “Configuring CapsLock Behavior” in Chapter 4, “System Configuration”.

Scroll Lock and the VX7

The Scroll Lock key is backlit **green** when Scroll Lock is off. When Scroll Lock is on, the backlight for the Scroll Lock key is **amber**.

The default values for CapsLock and Scroll Lock are Off.

Keyboard Backlight

The 95-key keyboard backlights each key. The keyboard backlight is manually controlled using the “backlight” key in the upper right hand corner of the keyboard. Pressing the backlight key cycles the keyboard backlight through the levels of backlight intensity:

- Off
- Maximum intensity
- Medium intensity
- Low intensity.

The 60-key QWERTY Keyboard

The 60-key keyboard has 101 keyboard functions, including a numeric keyboard pad. Please refer to Appendix A, “Key Maps”, for keypress combinations. This keyboard is also available with either an IBM 3270 or IBM 5250 overlay.

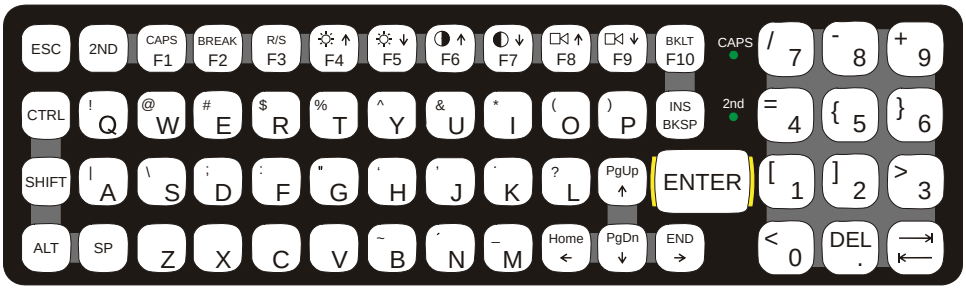

ESC 2ND CAPS F1 BREAK F2 R/S F3 F4 F5 F6 F7 F8 F9 BKLT F10 CAPS
CTRL Q W E R T Y U I O P INS BKSP 2nd
SHIFT A S D F G H J K L PgUp ENTER
ALT SP Z X C V B N M Home PgDn END DEL
7 8 9 4 5 6 1 2 3 0

Figure 2-30 The 60-key QWERTY Keyboard

IBM 3270 Keypad Overlay

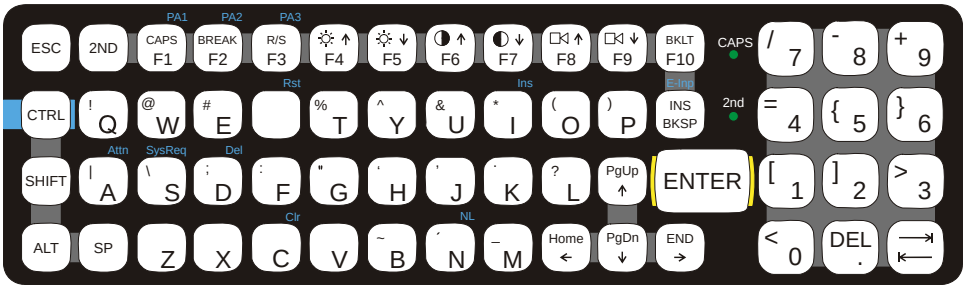

PA1 PA2 PA3
ESC 2ND CAPS F1 BREAK F2 R/S F3 F4 F5 F6 F7 F8 F9 BKLT F10 CAPS
Rst Ins E-Inp
CTRL Q W E T Y U I O P INS BKSP 2nd
Attn SysReq Del
SHIFT A S D F G H J K L PgUp ENTER
Clr NL
ALT SP Z X C V B N M Home PgDn END DEL
7 8 9 4 5 6 1 2 3 0

Figure 2-31 IBM 3270 Specific Keypad

The 60-key keypad is available with an IBM 3270 overlay designed to allow the user to enter terminal emulator commands when running LXE’s RFTerm™ program.

IBM 5250 Keypad Overlay

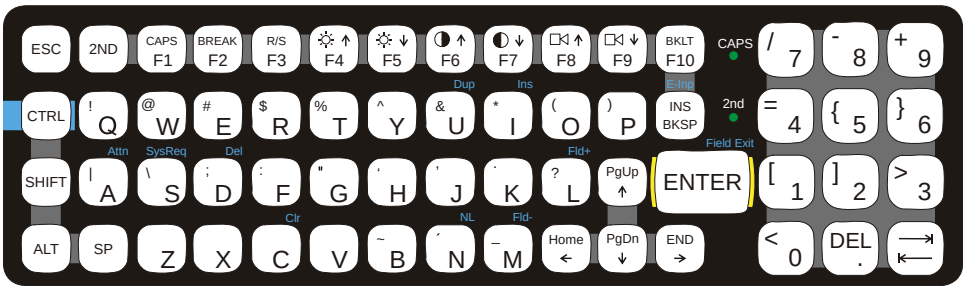

ESC 2ND CAPS F1 BREAK F2 R/S F3 F4 F5 F6 F7 F8 F9 BKLT F10 CAPS
Dup Ins E-Inp
CTRL Q W E R T Y U I O P INS BKSP 2nd
Attn SysReq Del Fld+ Field Exit
SHIFT A S D F G H J K L PgUp ENTER
Clr NL Fld-
ALT SP Z X C V B N M Home PgDn END DEL
7 8 9 4 5 6 1 2 3 0

Figure 2-32 IBM 5250 Specific Keypad

The 60-key keypad is available with an IBM 5250 overlay designed to allow the user to enter terminal emulator commands when running LXE’s RFTerm™ program.

Key Maps

The 60-key keyboard supports all 101 keyboard functions. However, because the keyboard only has 60 keys, all functions are not visible (or printed on the keyboard). Therefore the VX7 keyboard supports what is called hidden keys -- keys that are accessible but not visible on the keyboard.

The hidden keys supported by the VX7 are listed in Appendix A, “Key Maps”.

NumLock and the VX7

The 60-key keyboard does not have a NumLock indicator or key. NumLock can be toggled On or Off using the <2nd> <SHIFT> <F10> keypress sequence.

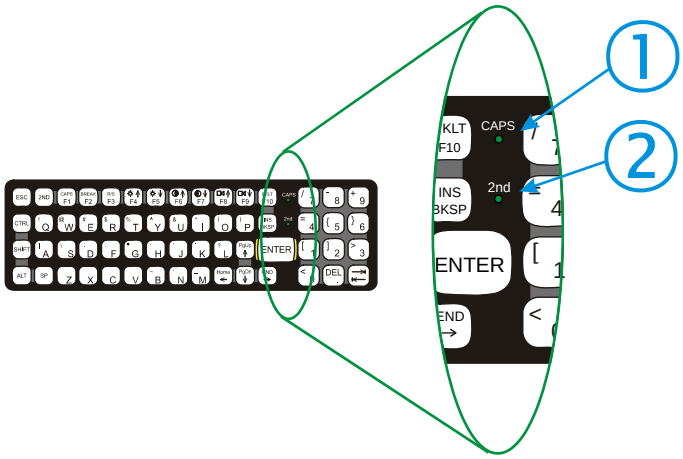
For information on preserving NumLock configuration after a reboot, please see “Configuring NumLock Behavior” in Chapter 4, “System Configuration”.

Keyboard Backlight

The LXE keyboard keys are backlit. The backlight is manually controlled using the <2nd> + <CTRL> + <F10> keypress sequence.

Keyboard LEDs

The VX7 keyboard has three (2) LED indicators.



1. CapsLock Mode LED Indicator
2. Secondary Mode LED Indicator

Figure 2-33 Keyboard LEDs

CAPS LED

This LED indicates the state of the keyboard CapsLock mode. If CapsLock is enabled this LED is illuminated green. When CapsLock is off, the LED is dark.

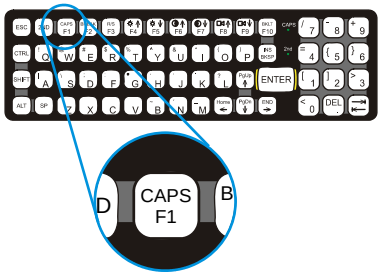


Figure 2-34 The CapsLock Key

Press <2nd> then <F1> to toggle CapsLock On and Off.

The default value of CapsLock is “Off”.

For information on preserving CapsLock configuration after a reboot, please see “Configuring CapsLock Behavior” in Chapter 4, “System Configuration”.

Secondary Keys LED

The VMT keyboard is equipped with several secondary keys. These keys are identified by the superscripted text found on the keyboard keys. The secondary keys are accessible by using two (2) keystrokes: the <2nd> key followed by the superscripted key.

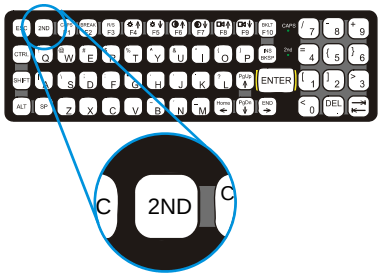


Figure 2-35 The Secondary Key

Once the <2nd> state is enabled (by pressing the <2nd> key) the Secondary Mode LED is illuminated and the <2nd> state is enabled until another key is pressed. The <2nd> key is toggled on with a <2nd> keypress and then immediately off with another <2nd> keypress.

For example:

Press <2nd> and <F1> to turn CapsLock on and off.

Press <2nd> and <↑> to initiate the PgUp command.

Press <2nd> and <Q> to type the "!" key.

Press <2nd> and <BkSp> to enter the Insert (Ins) mode.

Control Keys

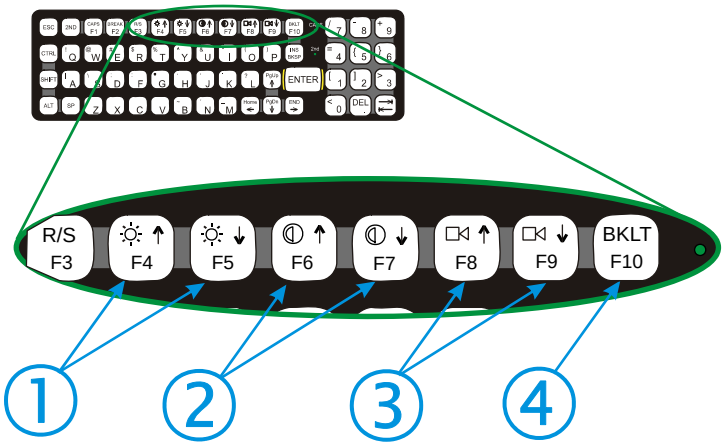
The VMT keyboard has several control keys. Because of the construction of the VX7 and the Microsoft Windows CE .NET operating system, many of the Control Keys are not used on the VX7.

Note: The 2nd functions of the <F4> and <F5>keys are not used as the display brightness is adjusted via the buttons on the VX7 Control Panel.

The 2nd functions of the <F6>, and <F7> keys are not used as the VX7 has TFT LCD screen with no provision for contrast adjustments.

The 2nd functions of the <F8> and <F9> keys are not used as the sound volume on the VX7 is controlled with the Volume and Sounds icon in the Microsoft Windows CE .NET Control Panel.

The <F10> key is used to toggle the backlight as part of the keypress sequence <2nd> + <CTRL> + <F10>. This key sequence immediately toggles the status of the keyboard backlight. Pressing <2nd> + <F10> has no effect on the keyboard backlight.



1. Display Brightness Control Keys (Not used)
2. Display Contrast Control Keys (Not used)
3. Speaker Volume Control Keys (Not used)
4. Backlight Control Key (See above)

Figure 2-36 The VMT Keyboard Display Controls

General Windows CE .NET Keyboard Shortcuts

Use the keyboard shortcuts in the chart below to navigate with any VX7 keyboard. These are standard keyboard shortcuts for Windows CE .NET applications.

Press these keys …	To …
CTRL + C	Copy
CTRL + X	Cut
CTRL + V	Paste
CTRL + Z	Undo
DELETE	Delete
SHIFT with any of the arrow keys	Select more than one item in a window or on the desktop, or select text within a document.
CTRL+A	Select all.
ALT+ESC	Cycle through items in the order they were opened.
CTRL+ESC	Display the Start menu.
ALT+Underlined letter in a menu name	Display the corresponding menu.
Underlined letter in a command name on an open menu	Carry out the corresponding command.
ESC	Cancel the current task.

The touchscreen provides equivalent functionality to a mouse:

- A touch on the touchscreen is equivalent to a left mouse click.
- Many items can be moved by the "drag and drop" method, touching the desired item, moving the stylus across the screen and releasing the stylus in the desired location.
- A double stylus tap is equivalent to a double click.
- A touch and hold is equivalent to a right mouse click.

Note: Some applications may not support this right click method. Please review documentation for the application to see if it provides for right mouse click configuration.

PS/2 Keyboard/Mouse

A standard PS/2 keyboard and mouse can be attached to the VX7 using the appropriate dongle cable. The dongle cable attaches to the VX7 and provides two PS/2 connectors, one labeled "Keyboard" and one labeled "Mouse". Please refer to documentation provided with the PS/2 keyboard and mouse for more information on their operation.

USB Keyboard/Mouse

A standard USB mouse can be attached to the VX7 using the appropriate dongle cable. A standard USB keyboard cane be attached to Platform 2 VX7's using the appropriate dongle cable. The dongle cable attaches to the VX7 and provides a USB connector. Please refer to documentation provided with the USB keyboard and mouse for more information on their operation.

To identify your VX7 platform type, please see "Identifying Your VX7", earlier in this chapter.

Input Panel (Virtual Keyboard)

The Input Panel may be enabled via the Input Panel icon in the Microsoft Windows CE .NET Control panel. The Input Panel can be displayed as a large or small keyboard.

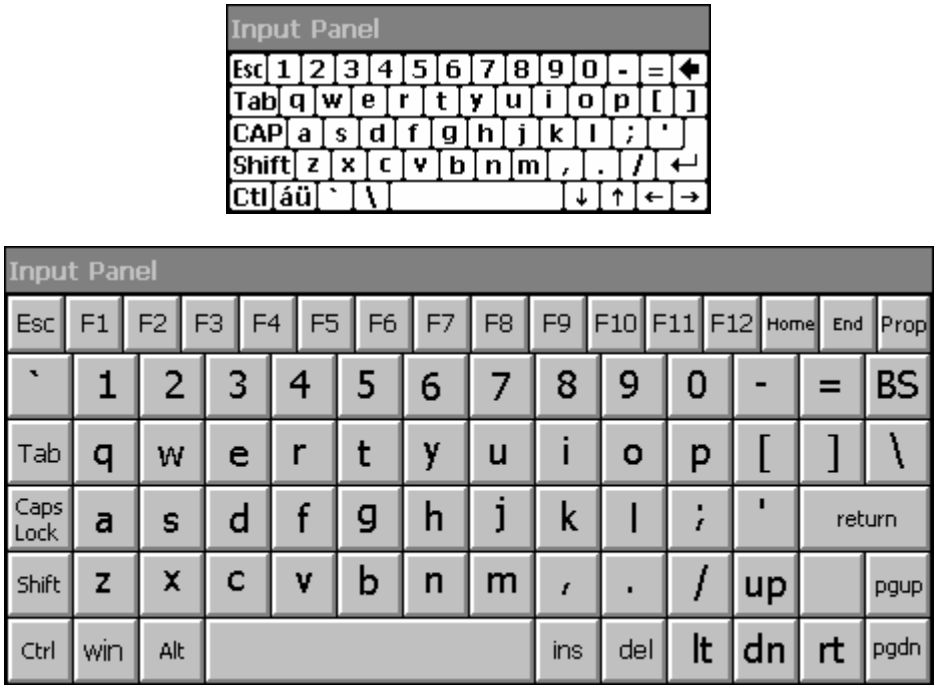

Input Panel
Esc 1 2 3 4 5 6 7 8 9 0 - = ←
Tab q w e r t y u i o p [ ]
CAP a s d f g h j k l ; '
Shift z x c v b n m , . / ↵
Ctl áü ` \ ↓ ↑ ← →
Input Panel
Esc F1 F2 F3 F4 F5 F6 F7 F8 F9 F10 F11 F12 Home End Prop
` 1 2 3 4 5 6 7 8 9 0 - = BS
Tab q w e r t y u i o p [ ] \
Caps Lock a s d f g h j k l ; ' return
Shift z x c v b n m , . / up pgup
Ctrl win Alt ins del lt dn rt pgdn

Figure 2-37 Small and Large Virtual Keyboards

Virtual keyboards display the actual character a keypress results in. For example, pressing the <Shift> key on the virtual keyboard toggles the characters displayed on the keys between upper and lower case. The <áü> key toggles the keys between standard and international symbols. The <Shift> and <áü> keys can be used in combination for capitalized international characters.

Note: When the virtual keyboard is displayed, the physical keyboard is still active, if attached. Therefore it is possible to input data from both keyboards.

Enabling the Input Panel

The Input Panel is disabled by default. To enable the Input Panel, select **Start | Settings | Control Panel |Input Panel** icon. Make sure the "Allow applications to change the input panel state" checkbox is checked and warmboot the VX7.

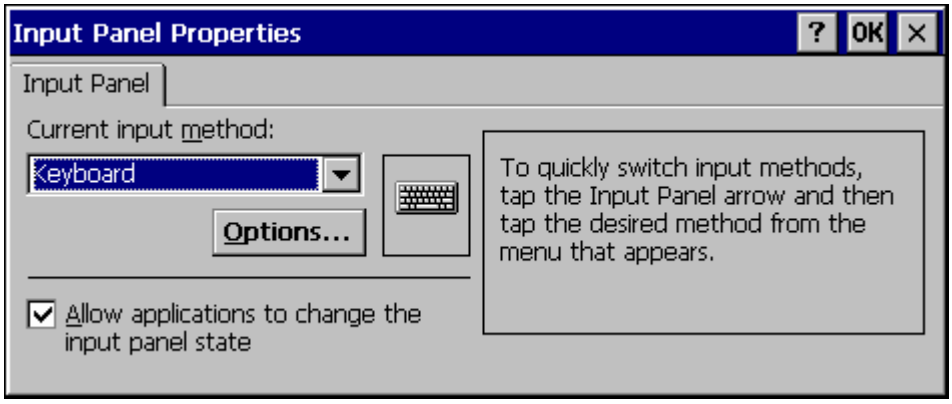

Input Panel Properties
?
OK
Input Panel
Current input method:
Keyboard
Options...
To quickly switch input methods, tap the Input Panel arrow and then tap the desired method from the menu that appears.
Allow applications to change the input panel state

Figure 2-38 Input Panel Properties

The Display

The VX7 Display is a thin-film transistor display capable of supporting SVGA graphics modes. Display size is 800 x 600 pixels. The display covering is designed to resist stains. The touchscreen allows signature capture and touch input.

The display supports screen blanking to eliminate driver distraction when the vehicle is in motion. Please see "Technical Specifications – Screen Blanking Cable" earlier in this chapter and "Screen Blanking" in Chapter 4, System Configuration" for details.

Cleaning the Display

Keep fingers and rough or sharp objects away from the display. If the glass becomes soiled or smudged, clean only with a standard household cleaner such as Windex® without vinegar or use Isopropyl Alcohol. Do not use paper towels or harsh-chemical-based cleaning fluids since they may result in damage to the glass surface. Use a clean, damp, lint-free cloth. Do not scrub optical surfaces. If possible, clean only those areas which are soiled. Lint/particulates can be removed with clean, filtered canned air.

Touchscreen

The touchscreen is a Resistive Panel with a scratch resistant finish that can detect touches by a stylus, and translate them into computer commands. In effect, it simulates a computer mouse. Only Delrin or plastic styluses should be used. A right mouse click is simulated by touching and holding the screen for the appropriate time interval.

Note: Always use the point of the stylus for tapping or making strokes on the display. Never use an actual pen, pencil or sharp object to write on the touchscreen.

An extra or replacement stylus may be ordered from LXE. See the "Accessories" section for the stylus part number.

Please refer to Chapter 4, "System Configuration" for more information on:

- Calibrating the touchscreen
- Disabling the touchscreen.

LXE offers a replaceable touchscreen protective film to protect the touchscreen when the VX7 is used in an abrasive environment. For information on installing or removing the protective film, please refer to the "VX7 User's Guide".

Touchscreen Heater

Extended temperature versions of the VX7 contain a touchscreen heater. The touchscreen heater can be disabled on Platform 2 VX7's when not needed. Please see "Disabling the Touchscreen Heater" in Chapter 4, "System Configuration".

Note: To identify your VX7 platform type, please see "Identifying Your VX7", earlier in this chapter.

PCMCIA, CF and SD Slots

The VX7 has two PCMCIA slots, one Compact Flash slot and one Secure Digital slot. The PCMCIA slots are stacked on top of each other and located on the right hand side of the opening. The PCMCIA slots support the Personal Computer Memory Card International Association (PCMCIA) 2.1 standards. The upper slot is designated as Slot A and the lower slot is designated as Slot B.

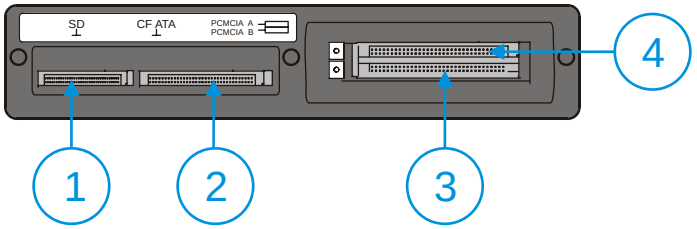
Slot A accepts Type I or II PCMCIA cards. If a radio card is used, it must be installed in Slot A to prevent damage to the internal radio cables. LXE supports only Type II 2.4GHz Spread Spectrum radios.

Slot B accepts Type I or II PCMCIA cards.

The PCMCIA slots may be disabled by the user. To enable or disable a PCMCIA slot, select **Start | Settings | Control Panel |PCMCIA** icon.

The center slot is a Compact Flash slot, containing the CF ATA hard drive. This drive contains the operating system and settings.

The left slot is used for Secure Digital (SD) memory cards.



1. SD Card Slot
2. Compact Flash Hard Drive
3. PCMCIA Slots

Figure 2-39 The PCMCIA and ATA Slots

PCMCIA Slots

Slot A and B PCMCIA Card Management is handled by Microsoft Windows CE .NET. The PCMCIA cards are Plug and Play devices and can be "hot swapped". For more details, refer to the Windows CE .NET help screens or refer to the documentation delivered with the PCMCIA card.

Note: Although cards in the PCMCIA slots may be hot swapped, the VX7 is not environmentally sealed while the access panel cover is removed to hot swap PCMCIA cards.

PCMCIA Pinout

Pin	Signal	Pin	Signal
1	GND	35	12V_RF_POWER
2	D3	36	-CDI
3	D4	37	D11
4	D5	38	D12
5	D6	39	D13
6	D7	40	D14
7	-CE1	41	D15
8	A10	42	-CE2
9	-OE	43	n.c. or VS1#
10	A11	44	-IORD
11	A9	45	-IOWR
12	A8	46	A17
13	A13	47	A18
14	A14	48	A19
15	-WE	49	A20
16	RDY/-IREQ	50	A21
17	SLOT_VCC	51	SLOT_VCC
18	SLOT-VPP	52	SLOT_VPP
19	A16	53	A22
20	A15	54	A23
21	A12	55	A24
22	A7	56	A25
23	A6	57	n.c. or VS2#
24	A5	58	RESET
25	A4	59	-WAIT
26	A3	60	-INPACK
27	A2	61	-REG
28	A1	62	BVD2/-SPKR
29	A0	63	BDV1/-STSCHG
30	D0	64	D8
31	D1	65	D9
32	D2	66	D10
33	WP/A_-IOIS16	67	-CD2
34	GND	68	GND

Install PCMCIA Cards

Equipment Needed: Phillips No. 1 screwdriver and a Torque wrench capable of measuring to 9±1 inch pounds (1.016±.11 N/m).

Note: The example below details installing a 2.4GHz radio card. Installation of other PCMCIA cards is similar, except there is no antenna.

Install the 2.4GHz Type II PCMCIA Radio

Caution	*The LXE Model VX7 Vehicle Mount Computer is specifically for use with LXE Model 6726, 6816 and 6830 2.4GHz Type II PCMCIA radios. Substitution of other PCMCIA radios will void the FCC, Industry Canada and other international radio certifications for the Model VX7 Vehicle Mount Computer and is strictly prohibited.*

1. Turn the VX7 off and detach the power cable.

2. Loosen the three (3) Phillips head screws securing the access panel cover so the cover can be removed. The screws are a captive part of the cover and cannot be removed.

   Partially insert the 2.4GHz Type II PCMCIA Radio into Slot A (the upper right slot).

Caution Slot A MUST BE used for the radio card. Installing a radio card in Slot B can result in pinching or other damage to the internal antenna cable.

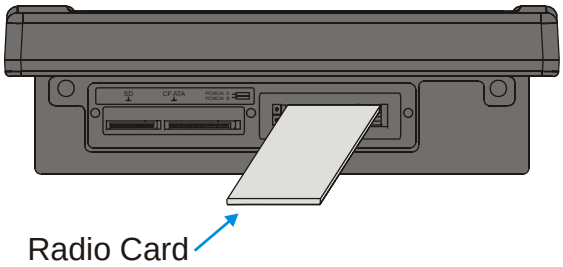


Figure 2-40 Inserting the 2.4GHz Type II PCMCIA Radio

Note: The tethered access panel cover is not shown in the illustration above.

3. Before completely inserting the 2.4GHz Radio, connect the Antenna Cable to the 2.4GHz Radio, using the port(s) indicated below:

   Note: Radio cards for single antenna units may have the unused antenna port covered with tape.

   The internal antenna is a dual (diversity) antenna.

Cisco Radio Card

Hold the radio card with the Cisco logo label facing up. Connect the antenna cable(s) as follows:

- Cisco radio with single antenna – Connect antenna cable to right port, as shown below.
- Cisco radio with dual antennas – Connect antenna cables to both ports.

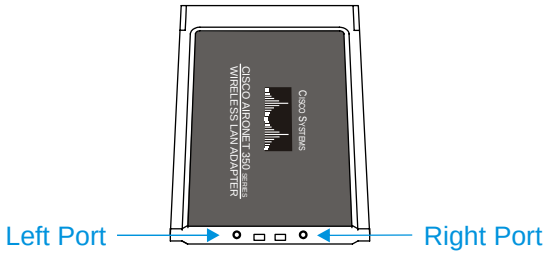


Figure 2-41 Cisco Antenna Cable Connections

Symbol 11Mb Radio Card

Hold the radio card with the Symbol logo label facing up. Connect the antenna cable(s) as follows:

- Symbol 11Mb radio with single antenna – Connect antenna cable to Port A (left port), as shown below.
- Symbol 11Mb radio with dual antennas – Connect antenna cables to both ports.

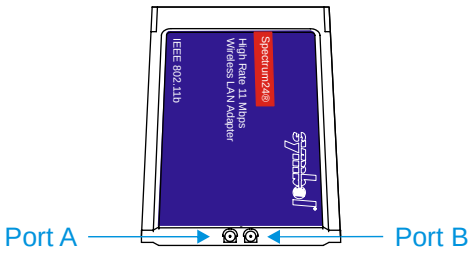


Figure 2-42 Symbol 11Mb Antenna Cable Connections

Summit CF Radio Card

The Summit CF radio is installed on a PCMCIA adapter. Hold the radio card with the antenna ports facing down. Connect the antenna cable(s) as follows:

- Summit radio with single antenna – Connect antenna cable to Main port. Auxiliary port is not used.
- Summit radio with dual antennas – Connect antenna cables to both Main and Auxiliary ports.

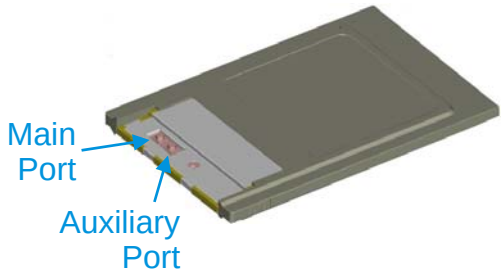


Figure 2-43 Summit Antenna Cable Connections

4. Now complete the insertion of the 2.4GHz Type II PCMCIA Radio into the slot.

   Note: When this process is complete, reattach the access cover screws using a torque wrench capable of measuring to 9±1 inch pounds (1.016±.11 N/m). The screws must be fastened to 9 inch pounds each. The screws require a Phillips size 1 driver head.

5. Re-connect the power cord/cable and turn the VX7 on.

6. For VX7's with a Summit radio, review RX Diversity and TX Diversity on the Global Settings tab of the Summit Client Utility to ensure these settings correspond to the VX7's antenna configuration.

CF Card Slot

This slot contains the Compact Flash (CF) hard drive.

⚠	The operating system and settings are stored on the CF card. The VX7 cannot operate without this card. Cards in this slot CANNOT be hot swapped.

Replace a CF Card

1. Turn the VX7 off and detach the power cable.
2. Loosen the three (3) Phillips head screws securing the access panel cover so the cover can be removed. The screws are a captive part of the cover and cannot be removed.
3. Remove the card currently installed present in the CF slot and replace it with the new CF card. The replacement CF card must contain the operating system in order for the VX7 to operate.

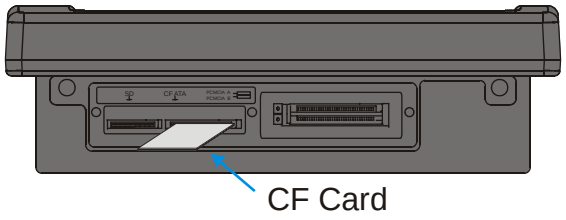


Figure 2-44 Inserting the CF ATA Card

Note: The tethered access panel cover is not shown in the illustration above.

Note: When this process is complete, reattach the access cover screws using a torque wrench capable of measuring to 9±1 inch pounds (1.016±.11 N/m). The screws must be fastened to 9 inch pounds each. The screws require a Phillips size 1 driver head.

4. Re-connect the power cord/cable and turn the VX7 on.

SD Card Slot

The slot accepts a Secure Digital (SD) memory card. The card in this slot can be hot swapped.

Note: Although cards in the SD slot may be hot swapped, the VX7 is not environmentally sealed while the access panel cover is removed to hot swap cards.

Install an SD Card

1. Turn the VX7 off and detach the power cable.
2. Loosen the three (3) Phillips head screws securing the access panel cover so the cover can be removed. The screws are a captive part of the cover and cannot be removed.
3. Insert the card into the ATA SD. This slot accepts an SD memory card only.

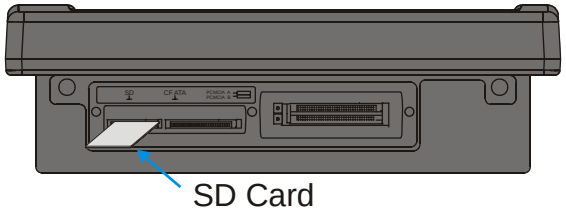


Figure 2-45 Inserting the ATA Card

Note: The tethered access panel cover is not shown in the illustration above.

Note: When this process is complete, reattach the access cover screws using a torque wrench capable of measuring to 9±1 inch pounds (1.016±.11 N/m). The screws must be fastened to 9 inch pounds each. The screws require a Phillips size 1 driver head.

4. Re-connect the power cord/cable and turn the VX7 on.

Chapter 3 Power Supply

Introduction

AC to DC power input for the VX7 is delivered via an optional external power supply. See "External Power Supply".

Vehicle power input for the VX7 is 12V to 80V DC nominal and is accepted without the need to perform any manual operation within the VX7. See "Vehicle 12-80VDC Direct Connection". An optional uninterruptible power supply (UPS) battery can be used with the vehicle DC power supply.

Power input is fused for protection and the fuse is externally accessible on the VX7.

External Power Supply

1. AC Input Cable (US only)
2. DC Output Cable

Figure 3-1 Optional Power Supply Cable

In North America, this unit is intended for use with a UL Listed ITE power supply with output rated 12 – 80 VDC, minimum 75 W. Outside North America, this unit is intended for use with an IEC certified ITE power supply with output rated 12 – 80 VDC, minimum 75 W.

The external power supply may be connected to either a 120V, 60Hz supply or, outside North America, to a 230V, 50Hz supply, using the appropriate detachable cordset. In all cases, connect the external AC supply to a properly grounded source of supply provided with maximum 15 Amp overcurrent protection (10 Amp for 230V circuits).

Note: Instructions for using this configuration are contained in "VX7 User's Guide" section titled "Installation".

Specifications

Feature	Specification
Dimensions	3.40” x 5.87” x 2.00”
Weight	<3.0 pounds
Input Power Switch	None
Power “ON” Indicator	None
Input Fusing	None
Input Voltage	90VAC min - 264VAC max
Input Frequency	47 - 63 Hz
Input Surge Current	50 Amps max @ 264VAC input
Input Connector	Standard IEC input power cord (included with US units only)
Output Connector	3 pin female connector
Output Voltage	+24VDC
Output Voltage Tolerance	+/- 8%, measured at the end of the output power cable
Output Current	0 Amps min, 1.87 Amps max
Safety and Emissions Compliance	FCC, Part 15, Radio Frequency Devices, Class B. EN 55022 UL1950 and IEC 950

Environmental Specifications

The AC to DC adapter will withstand the following environmental characteristics:

Feature	Specification
Operating Temperature	see VX7 Environmental Specifications
Storage Temperature	see VX7 Environmental Specifications
Humidity	Operates in a relative humidity of: 5 – 95% (non-condensing)
ESD Immunity	Per IEC 801-1

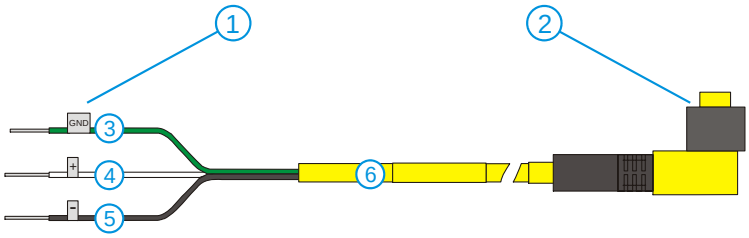
CMOS Battery

The LXE VX7 has a permanent 190 mAh Lithium battery installed to maintain time, date and CMOS setup information. The lithium battery is not user serviceable and should last five years with normal use before it requires replacement.

Note: This battery should only be changed by authorized service personnel.

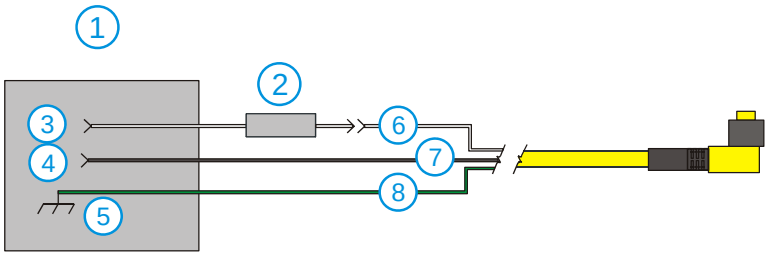
Vehicle 12-80VDC Direct Connection

Note: Instructions for using this configuration are contained in "VX7 User's Guide" section titled "Installation".



1. To Vehicle Battery
2. To Vehicle Mounted Device or UPS Battery Pack
3. Green (GND)
4. Red / White (DC+)
5. Red / Black (DC-)
6. 12 – 80 VDC

Figure 3-2 Direct Vehicle Power Connection Cable (12 Ft.)



1. Vehicle Electrical System
2. 5 Amp Slow Blow Fuse
3. DC +
4. DC -
5. Vehicle Chassis
6. Red / White
7. Red /Black
8. Green

Figure 3-3 Connecting the Power Cable to the Vehicle

Note: Correct electrical polarity is required for safe and proper installation. Connecting the cable to the VX7 with the polarity reversed will cause the VX7's fuse to be blown. See the following table for wire color-coding specifics.

Wiring color codes for LXE supplied DC input power cabling:

Vehicle Supply		Wire Color
+12 - 80VDC	(DC +)	Red with White Stripe
Return	(DC -)	Red with Black Stripe
Vehicle Chassis	(GND)	Green

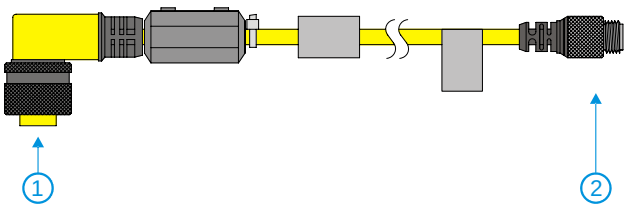
Figure 3-4 Vehicle Connection Wiring Color Codes

VX7 Input Power Specifications

Feature	Specification
DC Input Voltage	12 - 80 VDC
Input Current	3.5 Amps
Input Fuse	10A Time Delay
Input Power Switch	SPST 6 Amp 125VDC

Power Adapter Cable

LXE offers an adapter cable (part no. 9000A077CBLPWRADPTR) to adapt certain VX1, VX2 or VX4 DC power supplies to the VX7. Please read and follow all cautions in the "VX7 User's Guide" to determine if your present power supply can be used with the VX7.



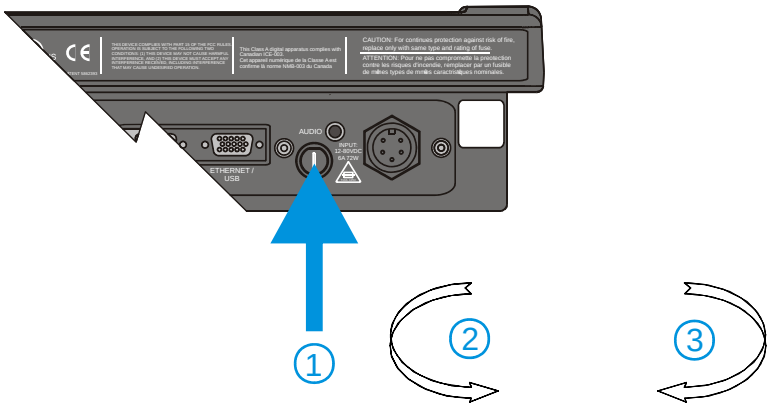
1. VX7 Connector
2. VX1/2/4 Power Supply Connector

Figure 3-5 Power Adapter Cable, VX1/2/4 to VX7

Caution:	For use only with VX1/2/4 DC power cables with yellow colored cable containing 18AWG wires. Do not use this cable with VX1/2/4 DC power cables with gray colored cable containing 22AWG wires. These power cables must be replaced with a VX5/6/7 power cable.
Caution:	When a DC power cable that is eight feet or longer is in a 12V application, there may be an excessive voltage drop over the longer cable. If this occurs, a new power cable is required.
Caution:	Do not use this adapter with AC power supplies originally designed for the 1380, 1390, VX1, VX2 or VX4. These power supplies do not have sufficient power for the VX7.

Fuse

The VX7 uses a 100V, 10A time delay (slow blow), high current interrupting rating fuse that is externally accessible and user replaceable. Should it need replacement, replace with same size, rating and type of fuse – Littlefuse 0234010 or Optifuse MSC-10A (5x20mm).



1. Fuse
2. Twist in this direction to remove
3. Twist in this direction to insert

Figure 3-6 Fuse Replacement

Caution: **Fuse has voltage on it even when power is off. Always disconnect input power before changing fuse.**

Chapter 4 System Configuration

Introduction

There are several different aspects to the setup and configuration of the VX7. Many of the setup and configuration settings are dependent upon the optional features such as hardware and software installed on the unit. The examples found in this chapter are to be used *as examples only*, the configuration of your specific VX7 computer may vary. The following sections provide a general reference for the configuration of the VX7 and some of its optional features.

Windows CE .NET 4.2

For general use instruction, please refer to commercially available Windows CE .NET user's guides or the Windows CE .NET on-line Help application installed with the VX7.

This chapter's contents assume the system administrator is familiar with Microsoft Windows options and capabilities loaded on most standard Windows computers.

Therefore, the sections that follow describe only those Windows capabilities that are unique to the VX7 and its Windows CE .NET environment.

2.4 GHz Radio Configuration

All 2.4GHz radio configuration is included in Chapter 5, "Wireless Network Configuration".

Warmboot

A warmboot reboots the computer without erasing any registry data. However, any applications installed to RAM are lost, as is all data in RAM. This happens because the operating system is stored on the flash drive, but must be loaded into RAM to run.

All registry configurations are automatically preserved. Any applications stored as .CAB files in the System directory and configured in the registry to persist are reinstalled on boot up by the Launch utility.

Coldboot

A coldboot reboots the computer, erases all registry data and returns the computer to factory default settings. In order to be preserved, applications and data must be stored in the System folder. Registry information is not preserved. Only factory default applications and drivers stored as .CAB files in the System directory are loaded by Launch.

A cold boot is initiated by running the Coldboot application in the \Windows directory. This application automatically cold boots the VX7, erasing any customer applied registry changes and returning the VX7 to its factory settings.

Installed Software

When you order a VX7 you receive the software files required by the separate programs needed for operation and radio communication. The files are loaded by LXE and stored in subdirectories in the VX7.

This section lists the contents of the subdirectories and the general function of the files. Files installed in each VX7 are specific to the intended function of the VX7.

Files installed in each VX7 configured for an RF environment contain PCMCIA card radio specific drivers – the drivers for each type of radio are specific to the manufacturer (e.g. Summit, Cisco, Symbol) for the radios installed in the RF environment and are not interchangeable.

Software Load

The software loaded on the VX7 computer consists of Windows CE .NET 4.2 OS, hardware-specific OEM Adaptation Layer, device drivers, Internet Explorer 6.0 for Windows CE browser and utilities. The software supported by the VX7 is summarized below:

Operating System

- Microsoft CE .NET version 4.2.

Radio Drivers

- Only one radio is installed in the VX7 at any one time. The 2.4GHz type of PC radio card resident on the VX7 determines the type of radio driver running on the VX7.

Note: Please contact your LXE representative to get access to CAB files as they are released by LXE.

Software Applications

The following applications are included:

- WordPad (was PocketWord in previous versions of Windows CE)
- Pocket Inbox
- Word Viewer
- Excel Viewer
- PDF Viewer
- Image Viewer
- Scanner Wedge (LXE developed)
- Transcriber
- Media Player
- Internet Explorer

Note that the viewer applications allow viewing documents, but not editing them.

Java (Optional)

Installed by LXE. Files can be accessed by tapping **Start | Programs | JEM-CE**. Doubletap the EVM icon to open the EVM Console. A folder of Java examples and Plug-ins is also installed with the Java option. LXE does not support Java applications running on the mobile device.

Desktop

For general use instruction, please refer to commercially available CE .NET user's guides or the CE .NET on-line Help application installed with the VX7.

The VX7 Desktop appearance is similar to that of a desktop PC running Windows 95, 98, NT, 2000 or XP.

At a minimum, it has the following icons that can be double tapped with the stylus to access My Computer, Internet Explorer, and the Recycle Bin.

At the bottom of the screen is the Start button. Clicking the Start Button causes the Start Menu to pop up. It contains the standard Windows menu options: Programs, Favorites, Documents, Settings, Help, and Run.

Desktop Icon	Function
My Computer	Access files and programs.
Recycle Bin	Storage for files that are to be deleted.
Internet Explorer	Connect to the Internet/intranet (requires radio card and Internet Service Provider – ISP enrollment is not available from LXE).
My Documents	Storage for downloaded files / applications.
Start	Access programs, select from the Favorites listing, documents last worked on, change/view settings for the control panel or taskbar, on-line help or run programs.

My Computer Folders

Folder	Description	Preserved upon Reboot?
System	Internal ATA Card (64 or 128 Meg total, minimum 28 Meg free for User Applications)	Yes
Network	Mounted network drive	No
Storage Card	ATA Card in Compact Flash or SD Card	No
Media Card	SD Memory Card	No
Windows	Operating System in ROM	No
Program Files	Applications	No
Application Data	Data saved by running applications	No
My Documents	Storage for downloaded files / applications	No
Temp	Location for temporary files	No

Folders Copies at Startup

The following folders are copied on startup:

System\Desktop => Windows\Desktop
System\Favorites => Windows\Favorites
System\Fonts => Windows\Fonts
System\Help => Windows\Help
System\Programs => Windows\Programs

This function copies only the directory contents, no sub-folders.

The following folders are NOT copied on startup:

Windows\AppMgr
Windows\Recent
Windows\Startup

Because copying these has no effect on the system or an incorrect effect.

Files in the Startup folder are executed, but only from System\Startup. Windows\Startup is parsed too early in the boot process so it has no effect.

Executables in System\Startup must be the actual executable, not a shortcut, because shortcuts are not parsed by launch.

Start Menu Program Options

The following options represent the factory default program installation. Your system may be different based on the software and hardware options purchased.

Access: **Start | Programs**

Cisco	**Set Cisco radio / network parameters** (Please see Chapter 5, "Wireless Network Configuration" for details)
Summit	**Set Summit radio / network parameters** (Please see Chapter 5, "Wireless Network Configuration" for details)
Communication	**Stores Network communication options**
ActiveSync	Transfer files between a VX7 and a desktop computer
Connect	Run this command after setting up a connection
Start FTP Server	
Stop FTP Server	
Microsoft File Viewers	**View downloaded files** (see Note)
Excel Viewer	View Excel 97 / 2000 / 2002 documents
Image Viewer	View BMP, JPEG and PNG images
PDF Viewer	View Adobe Acrobat documents
Word Viewer	View Word 97 / 2000 / 2002 and RTF files
Command Prompt	The command line interface in a separate window
Inbox	Microsoft Outlook mail inbox.
Internet Explorer	Access web pages on the world wide Internet
Media Player	Music management program
Microsoft WordPad	Opens an ASCII notepad
Remote Desktop Connection	Log on to a Windows Terminal Server.
Transcriber	Enter data using the stylus on the touchscreen.
Windows Explorer	File management program

Note: The Microsoft File Viewers cannot display files that have been password protected.

Communication

Access: **Start | Programs | Communication**

Note: Some communication menu options require an external modem connection to the VX7. Modems are not available from LXE nor supported by LXE.

ActiveSync

Once a relationship (partnership) has been established with Connect, ActiveSync will synchronize using the radio link on the VX7. See also: Chapter 1 "Introduction", section "ActiveSync – Initial Setup".

Requirement: ActiveSync version 3.7 (or higher) must be resident on the host (desktop/laptop) computer. ActiveSync is available from the Microsoft website. Follow their instructions to locate, download and install ActiveSync on your desktop computer.

For more information about using ActiveSync on your desktop computer, open ActiveSync, then open ActiveSync Help. See also section titled "Backup VX7 Files Using ActiveSync" for more ActiveSync information.

Synchronizing from the VX7 using a USB ActiveSync connection:

You must have set up ActiveSync on your desktop computer and completed the first synchronization process before you initiate synchronization from your device.

1. To initiate synchronization from your device, connect the USB cable to the PC and to the dongle cable on the VX7. The VX7 connects automatically.
2. Click the **Sync Now** button to synchronize with the PC.
3. Click the **Disconnect** button or remove the cable to disconnect.
4. To modify the Synchronization settings, see the **Options** icon on the ActiveSync window on the desktop PC.

Synchronizing from the VX7 using Serial or RF connection:

You must have set up ActiveSync on your desktop computer and completed the first synchronization process before you initiate synchronization from your device.

1. To initiate synchronization from your device, tap **Start | Programs | Communication | ActiveSync** to begin the process.
2. Click the **Connect** button.
3. Tap the **Sync Now** button to synchronize with the PC.
4. Tap the **Disconnect** button to disconnect.
5. To modify the Synchronization settings, see the **Options** icon on the ActiveSync window on the desktop PC.

Connect

Connect is used to initiate a hardwired connection to a host. Several pre-defined connect setups are included in the factory setup:

- COM1 direct connect at 57600 or 115200 baud
- COM3 [1] direct connect at 57600 or 115200 baud
- USB direct connect

The default connection is USB direct connect.

After a connect setup is selected, **Start | Programs | Communication | Connect** will start to connect to a host. After this connection is made and an ActiveSync relationship established, the ActiveSync menu item can be used to establish the connection over the radio link.

See Also: "Important Information – Cold Boot and Loss of Host Re-connection"

Start FTP Server / Stop FTP Server

These shortcuts call the Services Manager to start and stop the FTP server. The server defaults to Off (for security) unless it is explicitly turned on from the menu.

[1] The COM3 port is labeled "COM2/3".

Command Prompt

Access: **Start | Programs | Command Prompt**

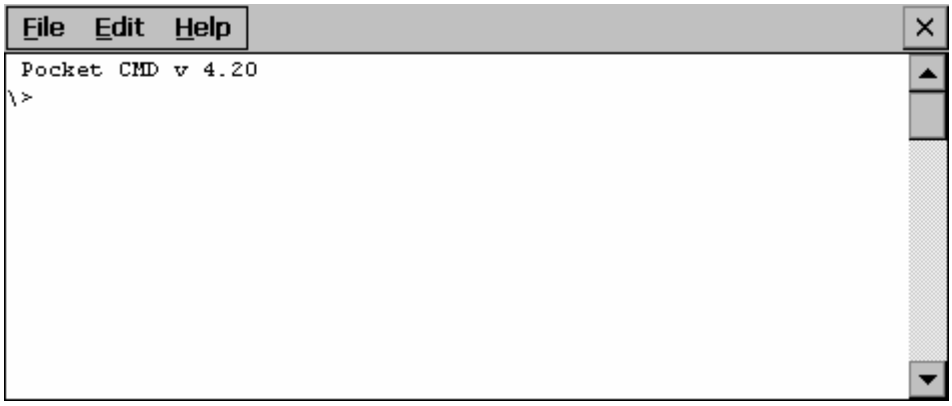


Figure 4-1 Pocket CMD Prompt Screen

Type help at the command prompt for a list of available commands.

Exit the Command Prompt by typing exit at the command prompt or select **File | Close**.

Inbox

Access: **Start | Programs | Inbox**

This option requires a connection to a mail server. There are a few changes in the CE .NET version of Inbox as it relates to the general desktop Windows PC Microsoft Outlook Inbox options. Click the "?" button to access Inbox Help. ActiveSync can be used to transfer messages between the VX7 inbox and a desktop inbox.

Internet Explorer

Access: **Start | Programs | Internet Explorer**

This option requires a radio card and an Internet Service Provider. There are a few changes in the CE .NET version of Internet Explorer as it relates to the general desktop Windows PC Internet Explorer options. Click the "?" button to access Internet Explorer Help.

Media Player

Access: **Start | Programs | Media Player**

There are few changes in the CE .NET version of Media Player as it relates to the general desktop Windows PC Microsoft Media Player options. Click the "?" button to access Media Player Help.

Remote Desktop Connection

Access: **Start | Programs | Remote Desktop Connection**

There are few changes in the CE .NET version of Remote Desktop Connection as it relates to the general desktop Windows PC Microsoft Remote Desktop Connection options.

Select a computer from the drop down list or enter a host name and tap the Connect button.

Tap the **Options** >> button to access the General, Display, Local Resources, Programs and Experience tabs. Click the "?" button to access Remote Desktop Connection Help.

Transcriber

Access: **Start | Programs | Transcriber**

Select Transcriber on the **Start** | **Programs** menu. To make changes to the Transcriber application, enable or disable the current Transcriber session, etc., click the "hand with a pen" icon in the toolbar. Click the "?" button or the Help button to access Transcriber Help.

Windows Explorer

Access: **Start | Programs | Windows Explorer**

There are a few changes in the CE .NET version of Windows Explorer as it relates to the general desktop PC Windows Explorer options. Click the "?" button to access Windows Explorer Help.

Taskbar

Access: **Start | Settings | Taskbar and Start Menu**

Factory Default Settings	
Always on Top	Enabled
Auto hide	Disabled
Show Clock	Enabled

There are a few changes in the CE .NET version of Taskbar as it relates to the general desktop PC Windows Taskbar options.

When the taskbar is auto hidden, press the **Ctrl** key then the **Esc** key to make the Start button appear.

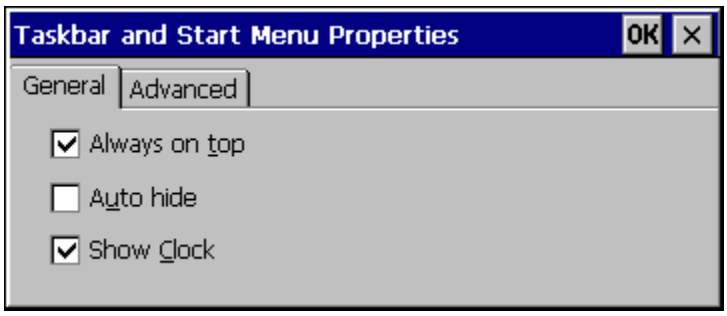


Figure 4-2 Taskbar Properties

Advanced Tab

Expand Control Panel

Tap the checkbox to have the Control Panel folders appear in drop down menu format from the **Settings | Control Panel** menu option.

Clear Contents of Document Folder

Tap the Clear button to remove the contents of the Document folder.

Control Panel Options

Access: **Start | Settings | Control Panel** or **My Computer | Control Panel**

Getting Help

Please click the "?" box to get Help when changing Control Panel options.

Option	Function
About	Displays hardware and software details.
Accessibility	Customize the way the keyboard, display or mouse functions.
Administrator Control	AppLock configuration. (See Chapter 6, "AppLock".)
Aironet Client Utility	Set the parameters for a Cisco radio. (See section "Start Menu Program Options", only present if Cisco radio software installed.)
Certificates	Manage digital certificates used for secure communication.
Date/Time	Set Date, Time, Time Zone, and Daylight Savings.
Dialing	Set dialup properties for internal modems (not supplied/supported by LXE).
Display	Set background graphic, color scheme appearance, and power scheme properties.
Input Panel	Select the current key / data input method.
Internet Options	Set General, Connection, Security and Advanced options for Internet connectivity.
Keyboard	Set key repeat delay and key repeat rate.
Mixer	Adjust the volume, record gain, and sidetone for microphone input.
Mouse	Set the double-click sensitivity for stylus taps on the touchscreen.
Network and Dial Up Options	Set network driver properties and network access properties.
Owner	Set VX7 owner details.
Password	Set VX7 access password properties.
PC Connection	Control the connection between the VX7 and a local desktop or laptop computer.
PCMCIA	Manage PCMCIA cards.
Power	Displays the status of all power managed devices.
Regional Settings	Set appearance of numbers, currency, time and date based on regional and language settings.
Remove Programs	Remove user installed programs in their entirety.
Scanner	Set scanner keyboard wedge, scanner icon appearance, active scanner port, and scan key settings. Assign baud rate, parity, stop bits and data bits for available COM ports.

Option	Function
Storage Manager	Manage storage devices, create partitions.
Stylus	Set double tap sensitivity properties and/or calibrate the touch panel.
System	Review System and Computer data and revision levels. Adjust Storage and Program memory settings.
Volume and Sounds	Set volume parameters and assign sound wav files to CE .NET events.

About

Access: **Start | Settings | Control Panel | About**

Displays hardware and software details.

Tab Title	Contents
Software	GUID, Windows CE Version, OAL Version, Bootloader Version, Compile Version, FPGA Version and Language
Hardware	CPU Type, Codec Type, FPGA Version, Scanner type, Display, Flash memory, and DRAM memory
Versions	LXE Utilities, LXE Drivers, LXE Image, LXE API, and Internet Explorer
Network IP	Current network connection IP and MAC address.

User application version information can be shown in the Version window. Version window information is taken from the registry.

Modify the Registry using the Registry Editor (see section titled “VX7 Utilities”). LXE recommends **caution** when editing the Registry and also recommends making a backup copy of the registry before changes are made.

The registry settings for the Version window are under HKEY_LOCAL_MACHINE \ Software \ LXE \ Version in the registry.

Create a new string value under this key. The string name should be the Application name to appear in the Version window. The data for the value should be the version number to appear in the Version window.

Language and Fonts

The **Software** tab displays any fonts built into the OS image.

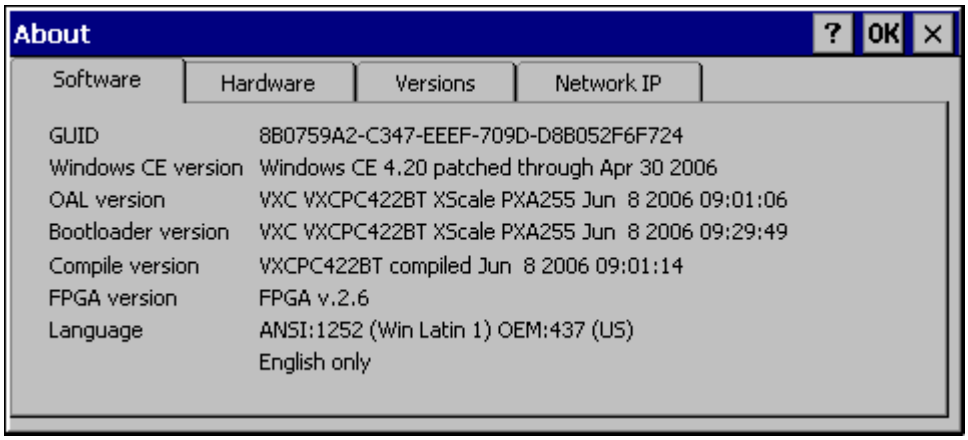


Figure 4-3 About Properties, Software

The fonts built into the OS image are noted in the Language section of this tab:

- English only – No additional fonts are built into the OS
- Japanese
- Simplified Chinese
- Traditional Chinese
- Korean

The listed Asian fonts are ordered separately and built-in to the VX7 OS image. Built-in fonts are added to registry entries and are available immediately upon startup. Thai, Hebrew, Arabic and Cyrillic Russian fonts are available in the (English only) default (extended) fonts.

When an Asian font is copied into the fonts folder on the /System folder; the font works for Asian web pages, the font works with RFTerm, the font does not work for Asian options in **Regional Settings** control panel, the font does not work for naming desktop icons with Asian names, the font does not work for third-party .NET applications, the font does not work for some third-party MFC applications.

Identifying Software Versions

The "Versions" tab displays the versions of many of the software programs installed. Not all installed software installed on the VX7 is included in this list and the list varies depending on the applications loaded on the VX7. The LXE Image line displays the revision of the system software installed. Please refer to the last three digits to determine the revision level (i.e.: in the example below, the revision level is 2BT).

Figure 4-4 About Properties, Versions

Radio MAC Address

The "Network IP" tab displays the MAC address of the radio card.

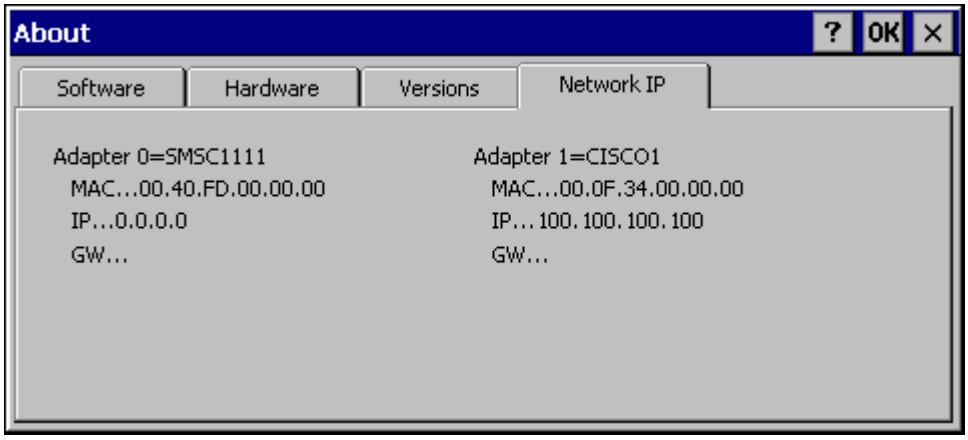


Figure 4-5 About Properties, Network IP

Accessibility

Access: Start | Settings | Control Panel | Accessibility

Customize the way the keyboard, sound, display, mouse, automatic reset and notification sound function. There is no change from general desktop Accessibility options. Adjust the settings and click the OK box to save the changes. The changes take effect immediately.

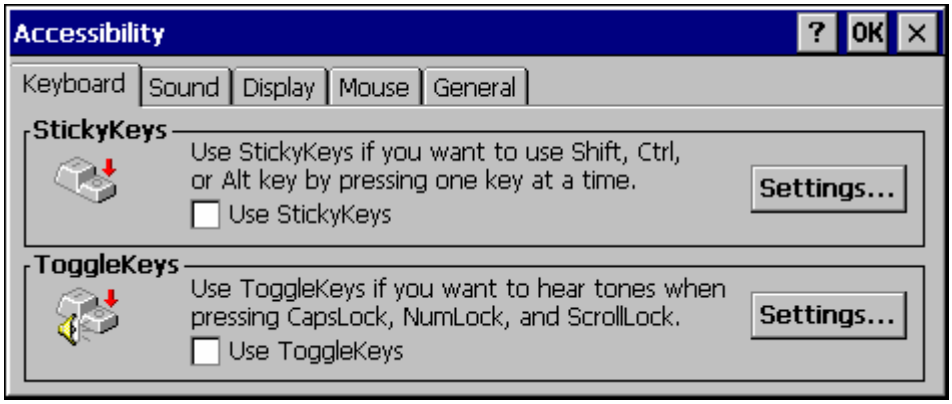


Figure 4-6 Accessibility Properties, Keyboard

If the StickyKeys option is selected, the Shift, Ctrl and Alt keys become sticky keys. When a sticky key is pressed and released, the key remains in effect to modify the next keypress.

If the ToggleKeys option is selected, please note that Scroll Lock key does not produce a sound as the CapsLock and NumLock keys do. This is due to a limitation in the Microsoft Windows CE .NET operating system.

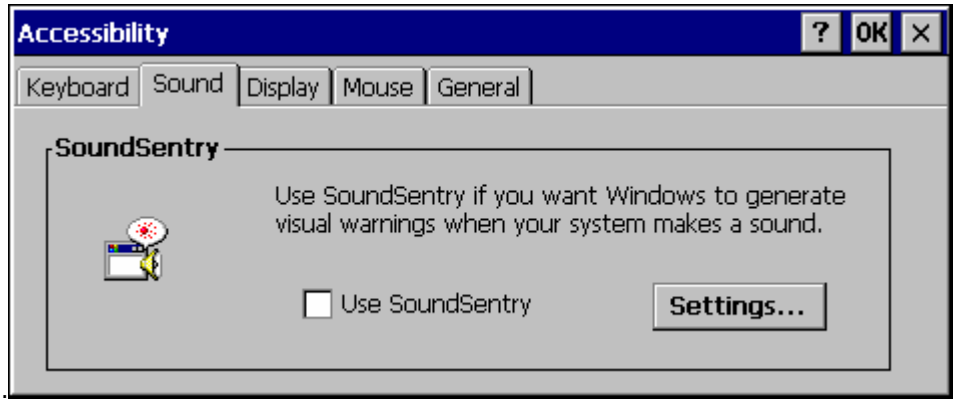


Figure 4-7 Accessibility Properties, Sound

If the SoundSentry option is selected, please note that Scroll Lock does not produce a visual warning as the CapsLock and NumLock keys do. This is due to a limitation in the Microsoft Windows CE .NET operating system.

Administrator Control

Access: **Start | Settings | Control Panel | PC Connection**

Use this option to set parameters for computers intended to be used as dedicated, single application devices. In other words, only the application or feature specified in the AppLock configuration by the Administrator is available to the user.

LXE devices with the AppLock feature are shipped to boot in Administration mode with no default password, thus when the device is first booted, the user has full access to the device and no password prompt is displayed. After the administrator specifies an application to lock, a password is assigned and the device is rebooted or the hotkey is pressed, the device switches to end-user mode.

AppLock also contains a component which sets configuration parameters as specified by the Administrator.

To set the AppLock parameters, please see Chapter 6, “AppLock” for details.

Certificates

Access: **Start | Settings | Control Panel | Certificates**

Manage digital certificates used for secure communication.

Lists the Stored certificates trusted by the VX7 user. These values may change based on the type of radio security resident in the client, access point or the host system.

Date/Time

Access: **Start | Settings | Control Panel | Date/Time Icon**

Set Date, Time, Time Zone, and Daylight Savings.

Factory Default Settings	
Current Time	Midnight
Time Zone	GMT-05:00
Daylight Savings	Disabled

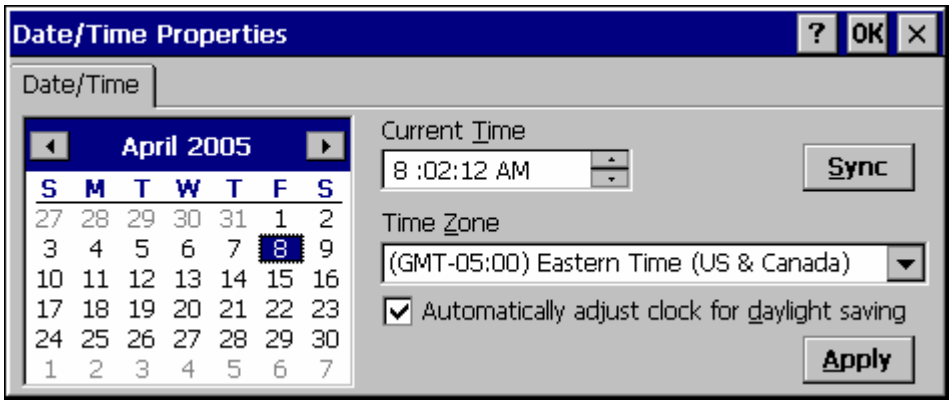

Date/Time Properties
?
OK
Date/Time
April 2005
S M T W T F S
27 28 29 30 31 1 2
3 4 5 6 7 8 9
10 11 12 13 14 15 16
17 18 19 20 21 22 23
24 25 26 27 28 29 30
1 2 3 4 5 6 7
Current Time
8 :02:12 AM
Sync
Time Zone
(GMT-05:00) Eastern Time (US & Canada)
Automatically adjust clock for daylight saving
Apply

Figure 4-8 Date/Time Properties

There is little change from general desktop PC Date/Time Properties options. Adjust the settings and click the OK box or the Apply button to save the changes. The changes take effect immediately. Double tapping the time displayed in the Taskbar causes this display to appear.

If an Internet connection is available, click the Sync button to synchronize time with a time server.

The VX7 includes a GrabTime utility:

- GrabTime can be executed manually at any time by clicking the **Sync** button on this control panel.
- GrabTime can be configured to synchronize the time at boot up. Please see "Enabling GrabTime", later in this chapter, for details.

Dialing

Access: **Start | Settings | Control Panel | Dialing**

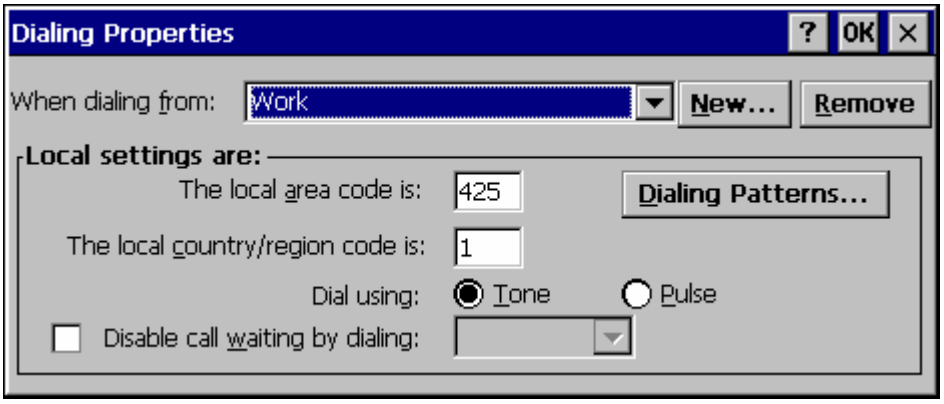


Figure 4-9 Dialing

Set dialup properties for internal modems (not supplied/supported by LXE). Tap the "?" and follow the instructions in Help.

Display

Access: **Start | Settings | Control Panel | Display Icon**

Set background graphic, color scheme appearance, and power scheme properties.

Factory Default Settings	
Background	Windows CE
Tile	Disable
Appearance	
Scheme:	Windows Standard
Backlight	
Battery Auto Turn Off	Enabled
Idle Time	30 seconds
External Auto Turn Off	Enabled
Idle Time	2 minutes

Background

There is no change from general desktop PC Display Properties / Background options. Adjust the settings and click the OK box to save the changes. The changes take effect immediately.

Appearance

No change from general desktop PC Display Properties / Appearance options. Adjust the settings and click the OK box to save the changes. The changes take effect immediately. The default is Windows Standard.

Backlight

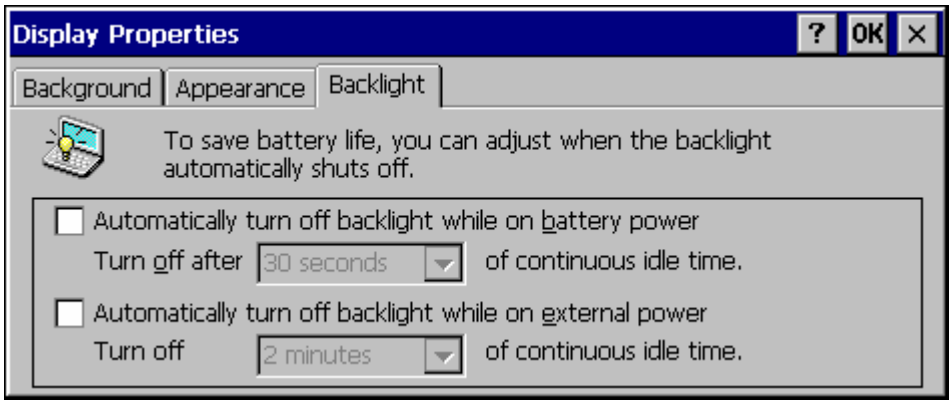


Figure 4-10 Display Properties / Backlight Tab

Adjust the settings and click the OK box to save the changes. The changes take effect immediately. When the backlight timer expires, the monochrome screen is turned off, the color transmissive backlight is dimmed not turned off.

Note: The display can also be configured to turn off when the vehicle to which the VX7 is mounted is in motion. This feature required a serial cable connection and is enabled using the Scanner control panel. Please see "Screen Blanking", later in this chapter, for details.

Input Panel

Access: **Start | Settings | Control Panel | Input Panel**

Select the current key / data input method.

Factory Default Settings	
Input Method	Keyboard
Allow applications to change input panel state	Disabled
Keys	Small keys
Use gestures	Disabled

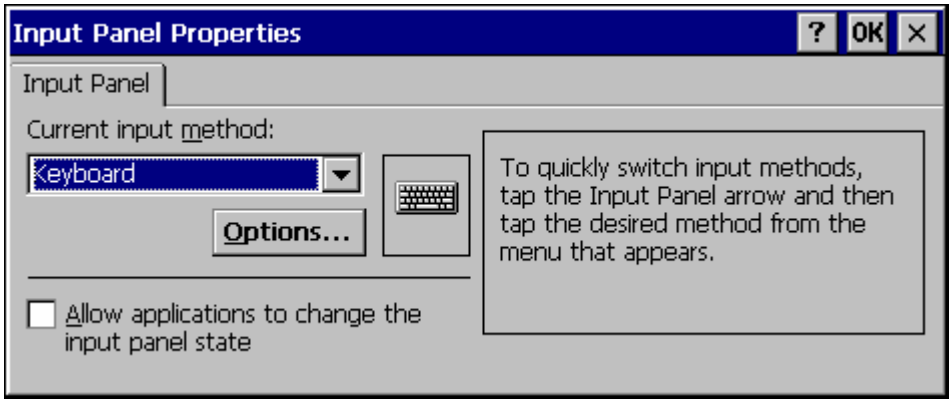

Input Panel Properties
?
OK
Input Panel
Current input method:
Keyboard
Options...
To quickly switch input methods, tap the Input Panel arrow and then tap the desired method from the menu that appears.
Allow applications to change the input panel state

Figure 4-11 Input Panel Properties

Use this option to make the Soft Keyboard or the keypad primarily available when entering data. Selecting Keyboard enables both.

The Input Panel is disabled by default. To enable the input panel, make sure the checkbox for "Allow applications to change input panel state" is checked and warmboot the VX7.

Internet Options

Access: **Start | Settings | Control Panel | Internet Options**

Set General, Connection, Security and Advanced options for Internet connectivity.

Factory Default Settings	
General	
Start Page	http://www.lxe.com/
Search Page	http://www.google.com
Cache Size	512 Kb
Connection	
Use LAN	Disabled
Autodial Name	Blank
Proxy Server	Disabled
Security	
Allow cookies	Enabled
Allow TLS 1.0 security	Disabled
Allow SSL 2.0 security	Enabled
Allow SSL 3.0 security	Enabled
Warn when switching	Enabled
Advanced	
Display web images	Enabled
Play web sounds	Enabled
Enable web scripting	Enabled
Display script error note	Disabled
Underline links	Never

Select a tab. Adjust the settings and click the OK box to save the changes. The changes take effect immediately.

Keyboard

Access: **Start | Settings | Control Panel | Keyboard Icon**

Set key repeat delay and key repeat rate.

Factory Default Settings	
Repeat	Enable
Delay	Short
Rate	Slow
Key Map	Preload or 0409

There is no change from general desktop PC Keyboard Properties options. Adjust the settings and click the OK box to save the changes. The changes take effect immediately.

When new key maps are added to the registry, they will appear in the Key Map dropdown list on the Keyboard Panel.

These values do not affect virtual keyboard taps.

Mixer

Access: **Start | Settings | Control Panel | Mixer Icon**

Adjust the volume, record gain, and sidetone for microphone input.

Factory Default Settings	
Master Volume	0dB
Record Gain	22.5dB
Sidetone	12.0dB
Input	None

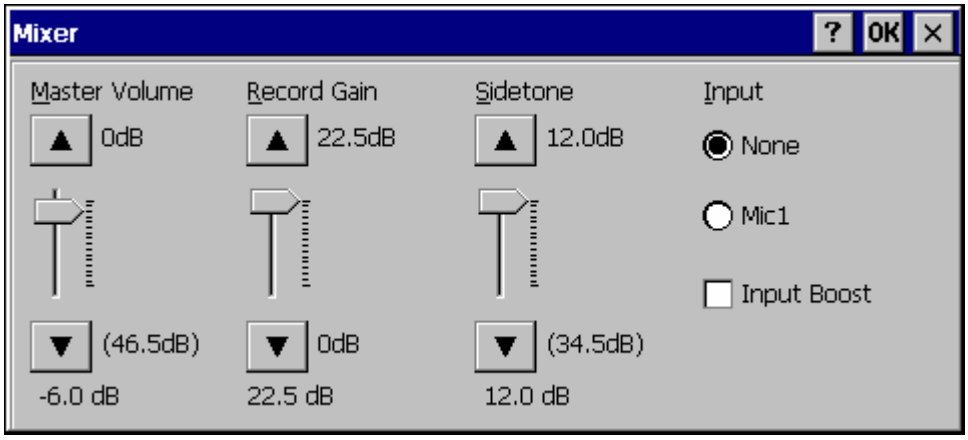


Figure 4-12 Mixer

Select the Input for the mixer. Move the sliders to adjust the decibel level. Tap OK to save the settings.

Note: Set Input to "None" when using stereo headphones. Set Input to "Mic1" when using a mono headset with microphone.

Mouse

Access: **Start | Settings | Control Panel | Mouse**

Set the double-click sensitivity for stylus taps on the touchscreen or an external mouse.

Network and Dialup Connections

Access: **Start | Settings | Control Panel | Network and Dialup Connections**

Create a dialup, direct, or VPN connection on the VX7.

To configure the VX7 to use DHCP or a fixed IP address, select the desired connection. The default is to obtain an IP address via DHCP.

A static IP address can be assigned by clicking the Specify an IP address radio button and entering the desired IP address, subnet mask and gateway.

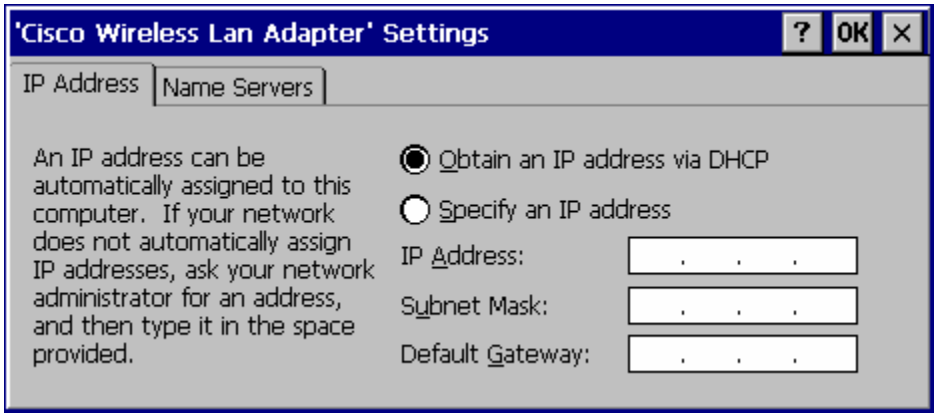

'Cisco Wireless Lan Adapter' Settings
?
OK
IP Address
Name Servers
An IP address can be automatically assigned to this computer. If your network does not automatically assign IP addresses, ask your network administrator for an address, and then type it in the space provided.
Obtain an IP address via DHCP
Specify an IP address
IP Address:
Subnet Mask:
Default Gateway:

Figure 4-13 Network Connection Properties

Owner

Access: **Start | Settings | Control Panel | Owner Icon**

Set VX7 owner details.

Factory Default Settings	
Identification	Blank
Notes	Blank

There is no change from general desktop PC Owner Properties display. Enter the information and click the OK box to save the changes. The changes take effect immediately.

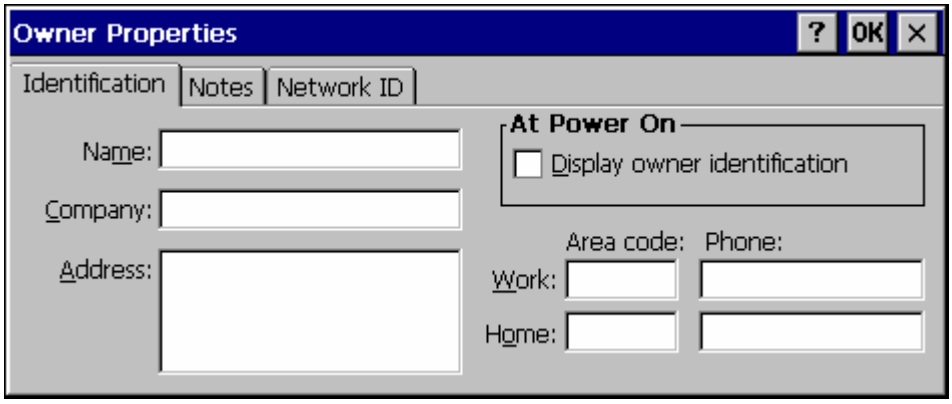


Figure 4-14 Owner Properties

Password

Access: **Start | Settings | Control Panel | Password Icon**

Set VX7 access/power up password properties.

Factory Default Settings	
Password	Blank
At Power On	Disabled

Note: Once a password is assigned, the Owner and Password Control Panel options require the password to be entered before the Control Panel option can be accessed. If you forget the password, it cannot be restored without performing a cold boot on the unit (which erases all memory).

Enter the password, then type it again to confirm it and click the OK box to save the changes. The password is immediately in effect.

Tap the Power On checkbox to set whether the user types a password at Power On.

Tap the Screen Saver checkbox to set whether the user types a password to clear the screensaver. If there is no screensaver chosen, this checkbox is ignored.

Note: Screensaver option only works with Remote Desktop screensavers.

Figure 4-15 Password Properties

PC Connection

Access: **Start | Settings | Control Panel | PC Connection**

Control the connection between the VX7 and a nearby desktop/laptop computer.

Factory Default Settings	
Allow Connection	Enabled
Connect Using	'USB Client'

Tap the Change button to adjust the settings and click the OK button to save the changes. The changes take effect immediately.

Unchecking the "Allow connection with ….." disables ActiveSync.

Change ….

Clicking Change lists configured ActiveSync connections. In addition, there is a checkbox for Automatic Connect. This option applies to USB connection only. If this checkbox is checked, when the USB cable is connected, the VX7 will automatically try to start ActiveSync over the USB port. Note that this interferes with processes on the configured port at the same time.

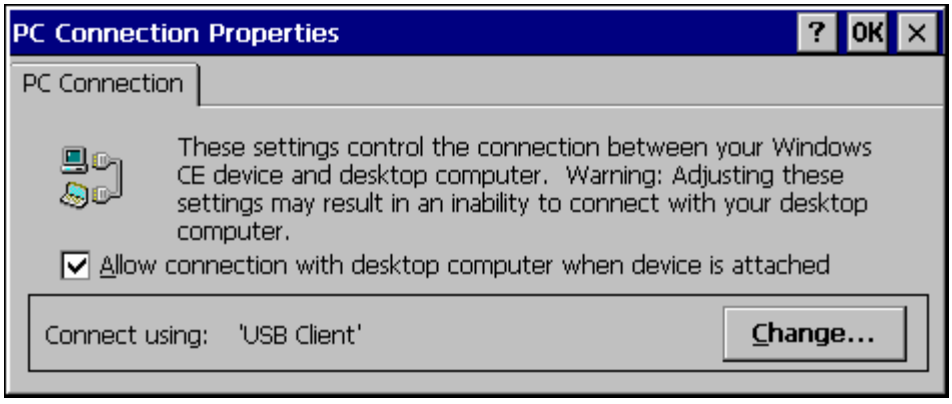

PC Connection Properties
?
OK
PC Connection
These settings control the connection between your Windows CE device and desktop computer. Warning: Adjusting these settings may result in an inability to connect with your desktop computer.
Allow connection with desktop computer when device is attached
Connect using: 'USB Client'
Change...

Figure 4-16 Communication / PC Connection Tab

Please refer to the "Backup VX7 Files" section later in this chapter for parameter setting recommendations.

PCMCIA

Access: **Start | Settings | Control Panel | PCMCIA**

Enable or disable the PCMCIA slots. Information on the card currently in the PCMCIA slots and the Compact Flash slot is provided.

Factory Default Settings	
Disable slot now	Unchecked

The Slot 0 and Slot 1 Tabs contain the same parameters. If a card is present in the slot, a description of the card is displayed. To disable a slot, check the Disable slot now checkbox and tap OK. The change takes effect immediately. Slot 0 is the lower slot, labeled "PCMCIA B". Slot 1 is the upper slot, labeled "PCMCIA A".

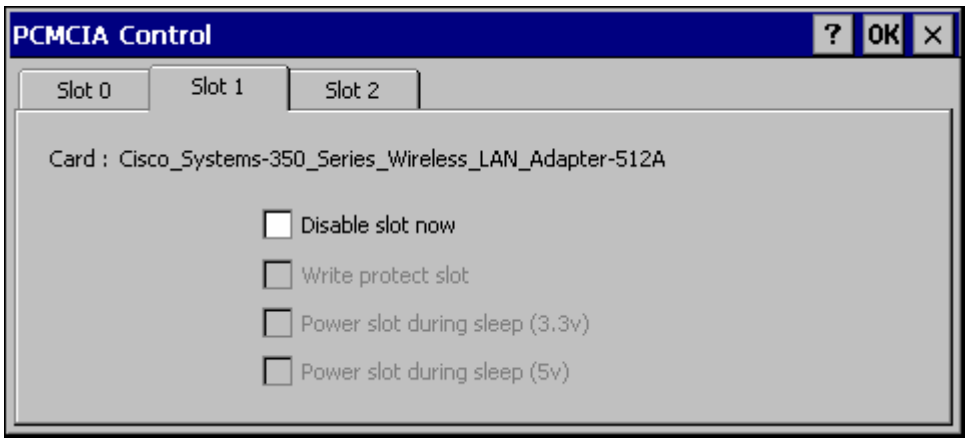


Figure 4-17 PCMCIA Control Tab, Slot 0 and Slot 1

The Slot 2 Tab provides information on the internal Compact Flash ATA drive. There are no user configurable options.

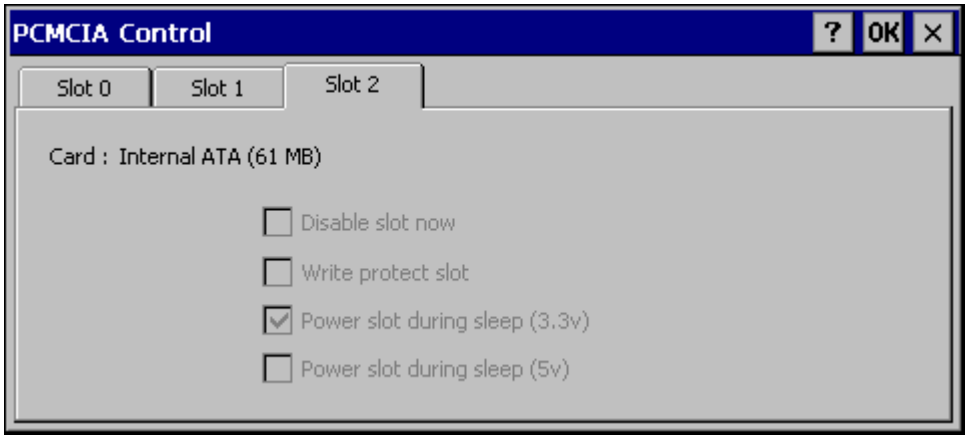


Figure 4-18 Compact Flash ATA Control Tab, Slot 2

Power

Displays the status of power managed devices. Note that since the VX7 does not support power management, all devices show the "high" power level. There are no user options on this screen.

There is no Suspend mode on the VX7.

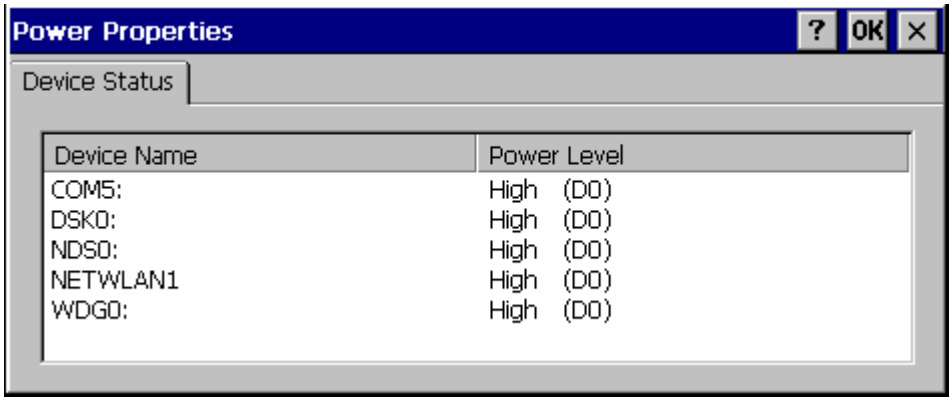


Figure 4-19 Power Properties

Regional Settings

Access: Start | Settings | Control Panel | Regional Settings

Set the appearance of numbers, currency, time and date based on regional and language settings.

No change from general desktop PC Regional Settings Properties options. Adjust the settings and click the OK box to save the changes. The changes take effect immediately.

Factory Default Settings	
Regional Setting	English (United States)
Number	123,456,789.00 / -123,456,789.00 neg
Currency	$123,456,789.00 pos / ($123,456,789.00) neg
Time	h:mm:ss tt (tt=AM or PM)
Date	M/d/yy short / dddd,MMMM,dd,yyyy long

Options (and defaults) for the regional settings depend on the fonts included in the OS image. Please refer to the section on the **About** control panel earlier in this chapter for more details.

Remove Programs

Access: Start | Settings | Control Panel | Remove Programs

No change from general desktop Remove Programs options. Select a program and click Remove. Follow the prompts on the screen to uninstall ***user-installed only*** programs. The change takes effect immediately.

Scanner

Access: **Start | Settings | Control Panel | Scanner**

Set scanner keyboard wedge, scanner icon appearance, active scanner port, and scan key settings. Assign baud rate, parity, stop bits and data bits for available COM ports.

Factory Default Settings		
Main		
Port 1	COM1	
Port 2	Disabled	
Power Port 1 while asleep	N/A	
Send key messages WEDGE	Enabled	
On Delay Ms	3000	
COM Ports	COM1	COM3 [2]
Baud Rate	9600	9600
Parity	None	None
Stop Bits	1	1
Data Bits	8	8
Power on Pin 9	On	Off
Advanced		
Strip Leading	Disabled, 0 Characters	
Strip Trailing	Disabled, 0 Characters	
Prefix	Disabled	
Suffix	Disabled	

Note: ActiveSync will not work over a COM port if that COM port is assigned to Port 1 or Port 2 in the Scanner applet as a scanner input. For example, if COM1 is being used by the scanner, COM1 can't be used by any other program.

Scanner control panel options may vary with software revision level. To identify the software revision, please click on the "About" icon in the CE .NET Control Panel.

[2] The COM3 port is labeled "COM2/3".

Main

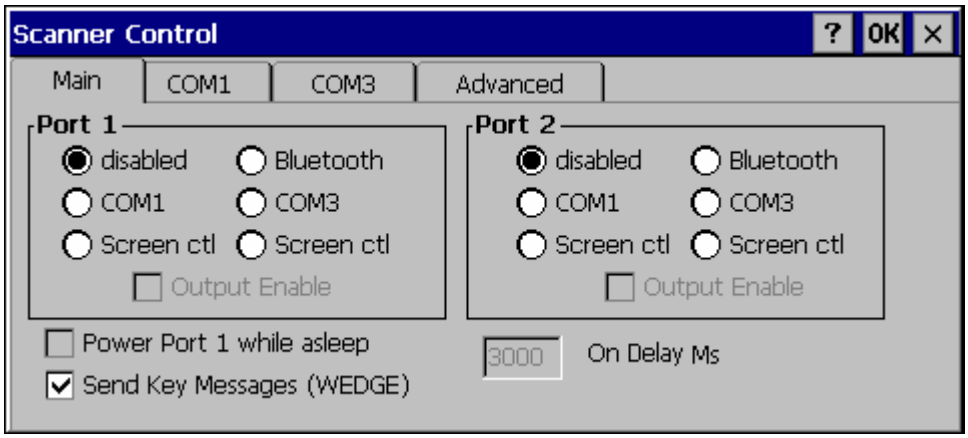


Figure 4-20 Scanner Properties / Main Tab

Adjust the settings and click the OK box to save the changes. The changes take effect immediately.

If "Send Key Messages …" is checked any data scan is converted to keystrokes and sent to the active window. When this box is not checked, the application will need to use the set of LXE Scanner APIs to retrieve the data from the scanner driver. Note that this latter method is significantly faster than using "Wedge".

Note: Bluetooth is not currently supported on the VX7.

COM Ports

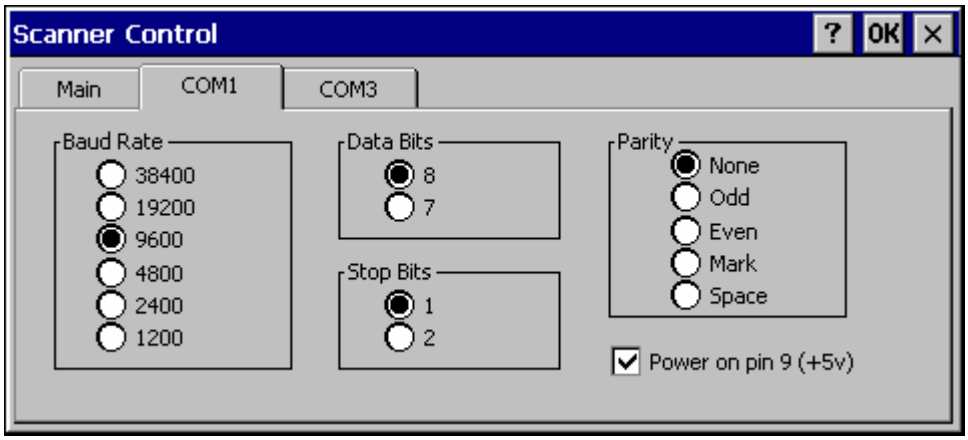


Figure 4-21 Scanner Properties / COM Port Settings

Adjust the settings and click the OK box to save the changes. The changes take effect immediately.

The COM1 display contains the same parameters as the COM3 Tab. Adjust the settings and click the OK box to save the changes. The changes take effect immediately.

Note: This panel configures the VX7 for an external scanner. It DOES NOT configure the tethered scanner. Please refer to the documentation for the tethered scanner for information on configuring the tethered scanner.

Serial Port Pin 9

To configure either COM port to have power (+5V) on Pin 9, check the "Power on pin 9 (+5V)" checkbox on the appropriate tab. This is required to supply power to an external scanner,

To configure either Com port to have RI on Pin 9, uncheck the "Power on pin 9 (+5V)" checkbox on the appropriate tab.

Advanced

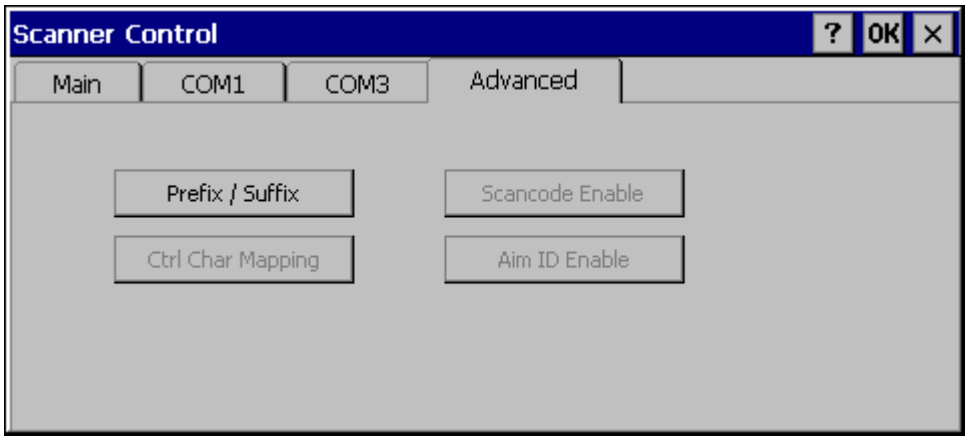


Figure 4-22 Scanner Properties / Advanced Settings

The Advanced tab provides options for working with the scanned barcode data. Click the **Prefix / Suffix** button for options to:

- Strip a specified number of characters from the leading end of the barcode data
- Strip a specified number of characters from the trailing end of the barcode
- Add a specified prefix to the beginning of the barcode data
- Add a specified suffix to the end of the barcode data.

Note: Any characters specified to be stripped from the bar code are removed before the prefix or suffix is appended.

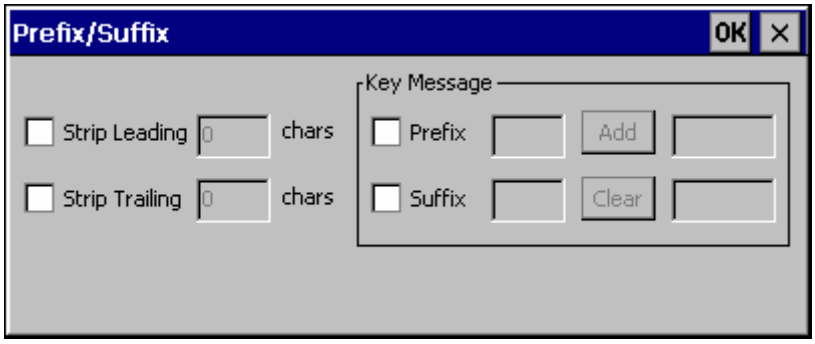


Figure 4-23 Scanner Properties / Advanced Settings

Strip Leading / Trailing Characters

This feature, when enabled, strips the specified number of characters from a barcode, either from the beginning (leading) or at the end (trailing), or both.

When this feature and the Add Prefix and / or Add Suffix features are both enabled, the leading and trailing characters are stripped before the prefix or suffix is appended.

The configuration for stripping leading and trailing characters is specified independently. To enable, either or both of the checkboxes labeled Strip Leading and Strip Trailing must be checked. Then the number of characters to be stripped can be typed into the edit control or set using the spin control on the right of the edit control.

The maximum number of characters that can be stripped is 99 characters for each leading and trailing number of characters. When the Strip Leading and Strip Trailing checkboxes are blank (or disabled), the edit controls are disabled; however the last specified number of characters to strip is retained and dimmed.

When the number of characters to be stripped is greater than the number of characters in the barcode a good read beep is sounded but all barcode data is discarded.

Add Prefix / Suffix

If Add Prefix and / or Add Suffix are combined with Strip Leading and / or Strip Trailing, the leading and / or trailing characters are stripped before the prefix or suffix is added.

The mode for Prefix/Suffix feature is determined by the "Send Key Messages (WEDGE)" setting in the **Main** tab. When checked (enabled), the prefix/suffix feature is in *Key Message mode*. Key message mode sends the prefix, barcode, and suffix to the application with the focus as keystrokes. In Key message mode all keys on the keypad can be entered.

When the "Send Key Messages" is not checked, *Block mode* is enabled. Block mode allows ASCII characters (0x0 – 0x7F), plus backspace, tab, delete, return and escape. In Block mode the prefix/suffix data is added to the beginning and end of the buffered barcode data that can then be read by an application from the WDG: device.

Up to 19 characters can be specified for the prefix and up to 19 characters can be specified for the suffix. The characters can be text or control characters, e.g. tab, carriage return. The characters can be entered into the prefix and suffix text boxes by typing from the keypad, entering the key's hex equivalent, or entering in hat (^) encoded delimited (8-bit code table) notation.

- To enable the Prefix or Suffix processing, check the associated checkbox. When the box is checked, the edit controls to the right are enabled. Keys/characters are typed into the edit control following the checkbox.
- Selecting the Add button then adds the key to the associated list of keys in the read-only edit control to the right of the Add / Clear buttons. The keys are shown as comma-delimited strings.
- To erase the Prefix or Suffix, select the read-only edit control that contains the currently configured Prefix or Suffix and select the Clear button.
- The Add and Clear buttons function on the control that is selected when the button is pressed.
- Hex values can be entered by preceding the two digit hex value with '0x'. Control characters can also be entered using the 'hat' delimited notation, i.e. ^M for Carriage Return.
- All keypad keys can be entered by typing the key. Some keypad keys are only valid if in "Key Message" mode. For example, the Function Keys (F1, PF1) are only valid in "Key Message" mode.

See "Hat Encoding" and "Decimal-Hexadecimal Chart" at the end of this chapter.

Screen Blanking

The VX7 can be configured to blank the display when the vehicle to which it is mounted is moving, eliminating a possible distraction for the driver. When configured properly, the screen blanking feature provides a tamper resistant method to blank the vehicle screen. The screen blanking feature consists of Scanner Control Panel Options and a customer supplied cable connected to one of the COM ports on the VX7. Properly configured, the display is visible only when the cable provides a signal that the vehicle has stopped.

The customer must supply their own cable. The cable specifications are detail in "Technical Specifications – Screen Blanking Cable" in Chapter 2, Physical Description and Layout".

The cable can be hooked to either the COM1 or COM3 port. The COM port used must be selected in the **Scanner** control panel.

Screen blanking is configured on the **Main** tab of the **Scanner** control panel.

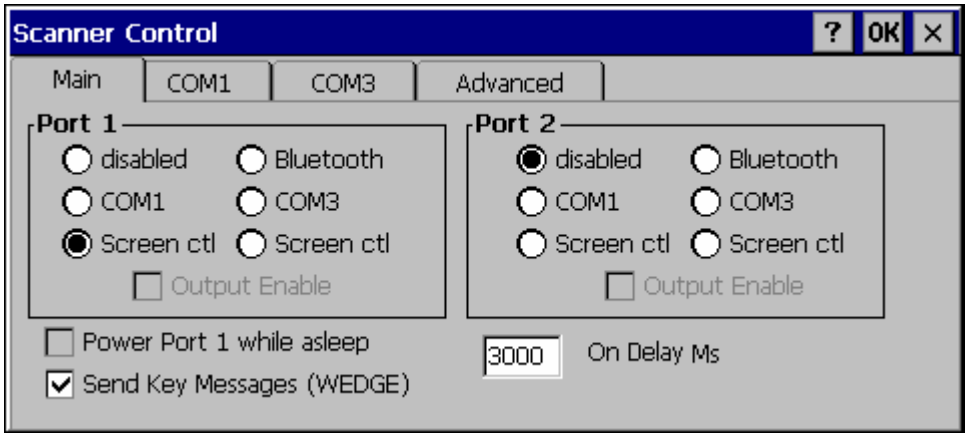


Figure 4-24 Scanner Properties / COM Port Settings

S	If the COM1/COM3 screen blanking and On Delay choices are not shown, the system load must be updated.
Warning ⚠	Do not select **Screen Ctl** for COM1 or COM3 unless you have already attached the cable described in "Technical Specifications – Screen Blanking Cable" in Chapter 2, Physical Description and Layout". Failure to attach the cable before selecting a screen blanking option will cause the screen to go blank (and remain blank) until an appropriate cable is attached to the specified COM port.

Set the desired COM port (Screen ctl for COM1 using the left radio button or COM3 using the right radio button) and On Delay. Press **OK**. The On Delay can be used to specify the time (in milliseconds) before the display turns on. For example, use the On Delay if the switch end of the cable is attached to the vehicle's accelerator pedal. Release of the accelerator may mean the truck is coasting to a stop rather than stationary. Configure the delay to allow time for the vehicle to coast to a stop.

To disable screen blanking, select COM1 or COM3 to return the selected COM port to normal operation.

Operation

To prevent a general user from disabling the screen blanking feature, at least one of the two following actions must be taken:

- Password protection can be set via the Password icon in the Windows Control Panel. Without this password, general users are unable to access the Control Panel to disable the screen blanking feature. For more information on the Password feature, please refer "Password", earlier in this chapter.
- AppLock can be used to restrict the general user's access to only a certain program. Since the user under AppLock cannot access the Control Panel, the user cannot disable the screen blanking feature. For more information on AppLock, please refer to Chapter 6, "AppLock".

Operation of the VX7 is unchanged except for the blank display. The keypad and touchscreen are still enabled, however any input from they keypad, touchscreen or other device **DOES NOT** wake up the display.

Storage Manager

Access: **Start | Settings | Control Panel | Storage Manager**

Installed storage devices are listed by device name in the dropdown box. To view information about the disk or perform store operations, select a device from the list.

On-line help is available for this option.

Topics available are:

- Manage storage devices
- Manage disk partitions
- Creating a new partition
- Advanced partition features

LXE recommends **caution** when formatting or dismounting storage devices and when creating new partitions or deleting partitions on the storage device.

The internal ATA (System) card does not appear in the Storage Manager menu.

Stylus

Access: **Start | Settings | Control Panel | Stylus**

Set double tap sensitivity properties and/or calibrate the touch panel.

Double Tap

Follow the instructions on the screen and click the OK box to save the changes. The changes take effect immediately.

Calibration

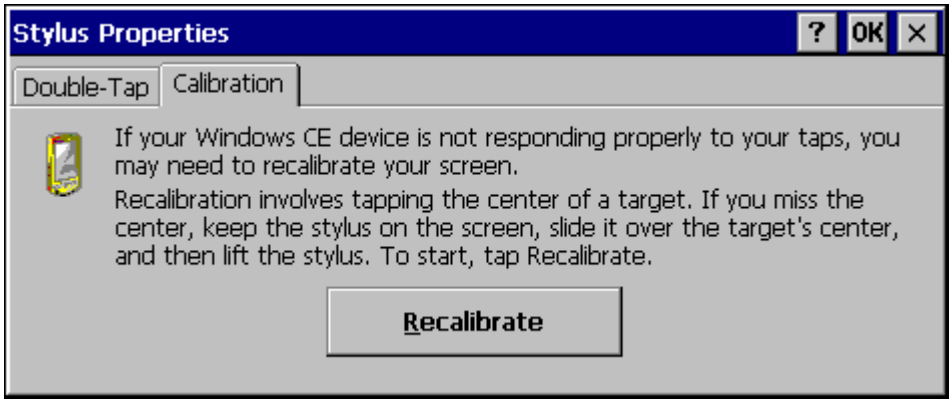

Stylus Properties
?
OK
Double-Tap
Calibration
If your Windows CE device is not responding properly to your taps, you may need to recalibrate your screen.
Recalibration involves tapping the center of a target. If you miss the center, keep the stylus on the screen, slide it over the target's center, and then lift the stylus. To start, tap Recalibrate.
Recalibrate

Figure 4-25 Stylus Properties / Recalibration Start

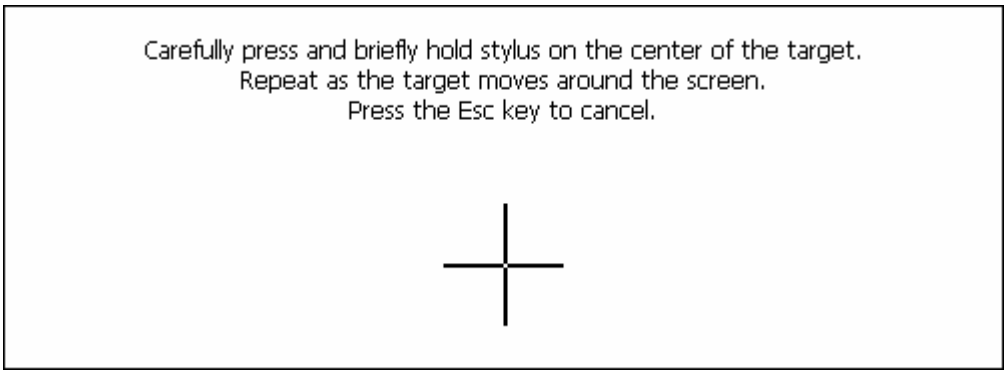

Carefully press and briefly hold stylus on the center of the target.
Repeat as the target moves around the screen.
Press the Esc key to cancel.

Figure 4-26 Stylus Properties / Recalibration

System

Access: **Start | Settings | Control Panel | System Icon**

Review System and Computer data and revision levels. Adjust Storage and Program memory settings.

Factory Default Settings	
General	N/A
Memory	1/3 storage, 2/3 program memory
Device Name	VXC0001
Device Description	LXE_VXC
Copyrights	N/A

General

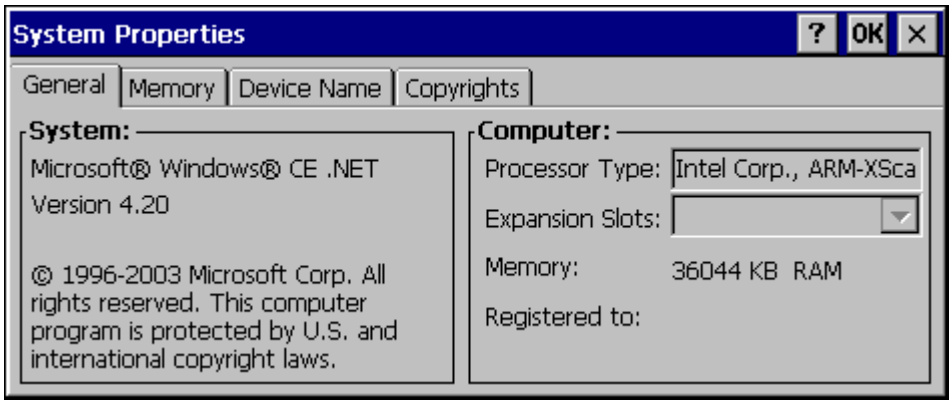


Figure 4-27 System / General tab

System: This screen is presented for information only. The System parameters cannot be changed by the user.

Computer: The processor type is listed. The type cannot be changed by the user. The name of the installed radio card is listed in the dropdown list. Total computer memory and the identification of the registered user is listed and cannot be changed by the user.

Memory sizes given do not include memory used up by the operating system. Hence, a system with 64 MB may only report 35 MB memory, since 29 MB is used up by the Windows CE .NET operating system. This is actual DRAM memory, and does not include internal flash or the internal ATA card used for storage.

Memory

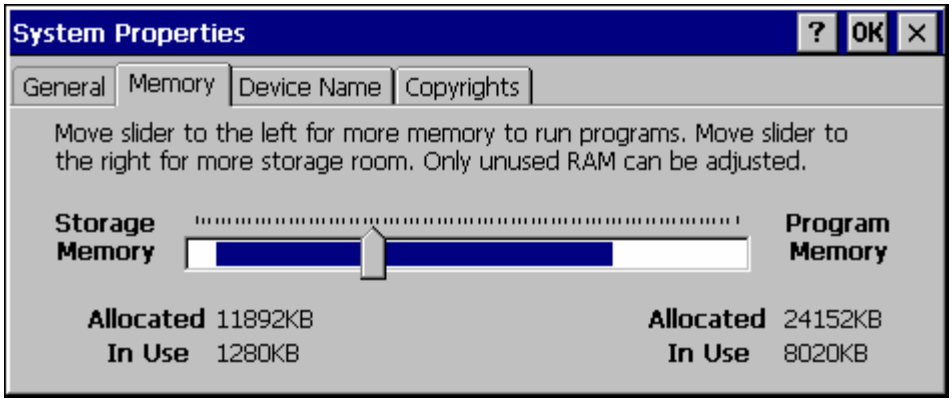


Figure 4-28 System / Memory

Move the slider to allocate more memory for programs or storage. If there isn't enough space for a file, increase the amount of storage memory. If the VX7 is running slowly, try increasing the amount of program memory. Adjust the settings and click the OK box to save the changes. The changes take effect immediately.

Device Name

Figure 4-29 System / Device Name

The device name and description can be changed. Enter the name and description using either the keypad or the Input Panel and tap OK to save the changes. The changes take effect immediately.

Copyrights

This screen is presented for information only. The Copyrights information cannot be changed by the user.

Volume and Sounds

Access: **Start | Settings | Control Panel | Volume & Sounds Icon**

Set volume parameters and assign sound wav files to CE .NET events.

Factory Default Settings	
Volume	
Events	Enabled
Application	Enabled
Notifications	Enabled
Volume	Middle of Bar
Key click	Loud
Screen tap	Loud
Sounds	
Scheme	LOUD!

Follow the instructions on the screen and click the OK box to save the changes. The changes take effect immediately.

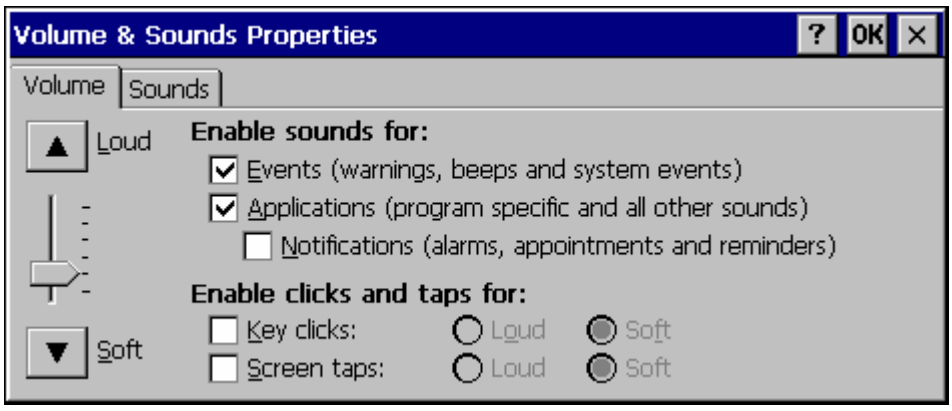


Figure 4-30 Volume and Sounds

Backup VX7 Files using ActiveSync

Using Microsoft ActiveSync version 3.7 or higher, you can synchronize information on your desktop computer with the VX7 and vice versa. Synchronization compares the data on your VX7 with your desktop computer and updates both with the most recent data.

For example, you can:

- Back up and restore your device data.
- Copy (rather than synchronize) files between your device and desktop computer.
- Control when synchronization occurs by selecting a synchronization mode. For example, you can synchronize continually while connected to your desktop computer or only when you choose the synchronize command.

If the VX7 is connected to a PC by a RS-232 or USB cable, disconnect the cable from the VX7 and reconnect.

Check that the correct connection is selected (Serial or USB "Client").

Note: By default, ActiveSync does not automatically synchronize all types of information. Use ActiveSync Options to specify the types of information you want to synchronize. The synchronization process makes the data (in the information types you select) identical on both your desktop computer and your device.

When installation of ActiveSync is complete on your desktop computer, the ActiveSync Setup Wizard begins and starts the following processes:

- connect your device to your desktop computer,
- set up a partnership so you can synchronize information between your device and your desktop computer, and
- customize your synchronization settings.

Because ActiveSync is already installed on your device, your first synchronization process begins automatically when you finish setting up your desktop computer in the ActiveSync wizard.

Prerequisites

VX7 and ActiveSync Partnership

A partnership between the VX7 and ActiveSync has been established. See section "ActiveSync – Initial Setup" in Chapter 1 "Introduction", "Getting Started".

Serial Port Transfer

- A desktop or laptop PC with an available serial port and a VX7 with a serial port. The desktop or laptop PC must be running Windows 95, 98, NT or 2000.
- Null modem cable with all control lines connected. LXE recommends using the null modem cable part number listed in Chapter 1 "Introduction", subsection "Accessories".

USB Transfer

- A desktop or laptop PC with an available USB port and a VX7 with a USB port. The desktop or laptop PC must be running Windows 98 SR2 or Windows 2000.
- A standard USB cable with a type A plug on one end, and a type B plug on the other.

Connect

Connect the modem cable to the PC (the host) and the VX7 (the client). Select "Connect" from the Start Menu on the VX7 (**Start | Programs | Communications | Connect)**.

Note: Run "Connect" when the "Get Connected" wizard on the host PC is checking COM ports to establish a connection for the first time.

Note: USB will start automatically when the cable is connected, not requiring you to select "Connect" from the Start menu.

Explore

From the ActiveSync Dialog on the Desktop PC, click on the Explore button, which allows you to explore the VX7 from the PC side, with some limitations. You can copy files to or from the VX7 by drag-and-drop. You will not be allowed to delete files or copy files out of the \Windows directory on the VX7. (Technically, the only files you cannot delete or copy are ones marked as system files in the original build of the Windows CE image. This, however, includes most of the files in the \Windows directory).

Disconnect

Serial Connection

- Disconnect the cable from the VX7.
- Click the status bar icon in the lower right hand corner of the status bar. Then click the Disconnect button.

USB Connection

- Disconnect the cable from the VX7.
- Click the status bar icon in the lower right hand corner of the status bar. Then click the Disconnect button.

Radio Connection

- Click the status bar icon in the lower right hand corner of the status bar. Then click the Disconnect button.

Important Information – Cold Boot and Loss of Host Re-connection

ActiveSync assigns a partnership between a client and a host computer. A partnership is defined by two objects -- a unique computer name and a random number generated when the partnership is first created. An ActiveSync partnership between a unique client can be established to two hosts.

If the VX7 is cold booted, the random number is deleted – and the partnership with the last one of the two hosts is also deleted. The host retains the random numbers and unique names of all devices having a partnership with it. Two clients cannot have a partnership with the same host if they have the same name. (**Control Panel | System | Device Name**)

If the cold booted VX7 tries to reestablish the partnership with the same host PC, a new random number is generated for the VX7 and ActiveSync will insist the unique name of the VX7 be changed. If the VX7 is associated with a second host, changing the name will destroy *that* partnership as well. This can cause some confusion when re-establishing partnerships with hosts.

Troubleshooting

ActiveSync on the host says that a device is trying to connect, but it cannot identify it

One or more control lines are not connected. This is usually a cable problem, but on a laptop or other device, it may indicate a bad serial port.

ActiveSync indicator on the host (disc in the toolbar tray) turns green and spins as soon as you connect the cable, before clicking the Connect icon (or REPLLOG.EXE in the Windows directory).

One or more control lines are tied together incorrectly. This is usually a cable problem, but on a laptop or other device, it may indicate a bad serial port.

ActiveSync indicator on the host turns green and spins, but connection never occurs

Baud rate of connection is not supported or detected by host. Try forcing ActiveSync on the desktop PC to use a specific baud rate and set the VX7 to use the same baud rate.

-or-

Incorrect or broken data lines in cable.

ActiveSync indicator on the host remains gray

The host doesn't know you are trying to connect. May mean a bad cable, with no control lines connected, or an incompatible baud rate. Try the connection again, with a known-good cable.

Testing connection with a terminal emulator program, or a serial port monitor

You can use HyperTerminal or some other terminal emulator program to do a rough test of ActiveSync. Set the terminal emulator to 8 bits, no parity, 1 stop bits, and the same baud rate as the connection on the CE device. After double-clicking REPLLOG.EXE on the CE device, the word "CLIENT" appears on the display in ASCII format. When using a serial port monitor, you see the host echo "CLIENT", followed by "SERVER". After this point, the data stream becomes straight (binary) PPP.

Create a Communication Option

1. On the VX7, select **Start | Settings | Control Panel | Network and Dialup Connections**. A window is displayed showing the existing connections.
2. Assuming the one you want does not exist, double-click **Make New Connection**.
3. Give the new connection an appropriate name. Click the **Direct Connection** radio button. Click the Next button.
4. From the popup menu, choose the port you want to connect to. Only the available ports are shown.
5. Click the **Configure...** button.
6. Under the **Port Settings** tab, choose the appropriate baud rate. Data bits, parity, and stop bits remain at 8, none, and 1, respectively.
7. Under the **Call Options** tab, be sure to turn off **Wait for dial tone**, since a direct connection will not have a dial tone. Set the timeout parameter (default is 90 seconds). Click OK.
8. **TCP/IP Settings** should not need to change from defaults. Click the **Finish** button to create the new connection.
9. Close the **Remote Networking** window.
10. To activate the new connection select **Start | Settings | Control Panel | PC Connection** and click the **Change** button.
11. Select the new connection. Click OK twice.
12. Close the Control Panel window.
13. Connect the desktop PC to the VX7 with the appropriate cable.
14. Click the desktop Connect icon to test the new connection.

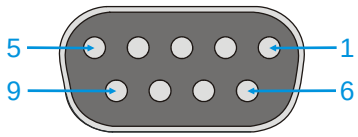
You can activate the connection by double-clicking on the specific connection icon in the Remote Networking window, but this will only start an RAS (Remote Access Services) session, and does not start ActiveSync properly.

Technical Specifications – Connection Cable

The exact serial cable is crucial. Many commercial null modem cables will not work. LXE recommends the following cable:

Serial cable:

9000A054CBL6D9D9



Pinout:

DB9 female	DB9 female
1	7
2	3
3	2
4	6, 8
5	5
6, 8	4
7	1
9	no connection

Figure 4-31 Pinout – Serial Cable for Synchronization

Some laptop devices do not properly implement all control lines on the serial port – the laptop connection will not work.

VX7 Utilities

The following files are pre-loaded by LXE.

LAUNCH.EXE

Launch works in coordination with registry settings to allow drivers or applications to be loaded automatically into DRAM at system startup. Registry settings control what gets launched; see the App Note for information on these settings. For examples, you can look at the registry key

HKEY_LOCAL_MACHINE \ Software \ LXE \ Persist

Launch will execute .CAB files, .BAT files, or .EXE files.

App Note

All applications to be installed into persistent memory must be in the form of Windows CE CAB files. These CAB files exist as separate files from the main installation image, and are copied to the CE device using ActiveSync, or using a Compact Flash ATA card. The CAB files are copied from ATA or using ActiveSync Explore into the folder System, which is the persistent storage virtual drive. Then, information is added to the registry, if desired, to make the CAB file auto-launch at startup.

The registry information needed is under the key HKEY_LOCAL_MACHINE \ Software \ LXE \ Persist, as follows. The main subkey is any text, and is a description of the file. Then 3 mandatory values are added:

FileName is the name of the CAB file, with the path (usually \System).

Installed is a DWORD value of **0**, which changes to **1** once auto-launch installs the file.

FileCheck is the name of a file to look for to determine if the CAB file is installed. This will be the name of one of the files (with path) installed by the CAB file. Since the CAB file installs into DRAM, when memory is lost this file is lost, and the CAB file must be reinstalled.

There are three optional fields that may be added:

Order is used to force a sequence of events. **Order=0** is first, and **Order=99** is last. Two items which have the same order will be installed in the same pass, but not in a predictable sequence.

Delay is used to add a delay after the item is loaded, before the next is loaded. The delay is given in seconds, and defaults to **0** if not specified. If the install fails (or the file to be installed is not found), the delay does not occur.

PCMCIA is used to indicate that the file (usually a CAB file) being loaded is a radio driver, and the PCMCIA slots should be started after this file is loaded. By default, the PCMCIA slots are off on powerup, to prevent the "Unidentified PCMCIA Slot" dialog from appearing. Once the drivers are loaded, the slot can be turned on. The value in the **PCMCIA** field is a DWORD, representing the number of seconds to wait after installing the CAB file, but before activating the slot (a latency to allow the thread loading the driver to finish installation). The default value of **0** means the slot is not powered on. The default values for the default radio drivers (listed below) is **1**, meaning one second elapses between the CAB file loading and the slot powering up.

The auto-launch process proceeds as follows:

- The launch utility opens the registry database and reads the list of CAB files to auto-launch.
- First it looks for **FileName** to see if the CAB file is present. If not, the registry entry is ignored. If it is present, and the Installed flag is not set, auto-launch makes a copy of the CAB file (since it gets deleted by installation), and runs the Microsoft utility WCELOAD to install it.
- If the Installed flag is set, auto-launch looks for the **FileCheck** file. If it is present, the CAB file is installed, and that registry entry is complete. If the **FileCheck** file is not present, memory has been lost, and the utility calls WCELOAD to reinstall the CAB file.
- Then, the whole process repeats for the next entry in the registry, until all registry entries are analyzed.
- To force execution every time (for example, for **AUTOEXEC.BAT**), use a **FileCheck** of **"dummy"**, which will never be found, forcing the item to execute.
- For persist keys specifying **.EXE** or **.BAT** files, the executing process is started, and then **Launch** will continue, leaving the loading process to run independently. For other persist keys (including **.CAB** files), **Launch** will wait for the loading process to complete before continuing. This is important, for example, to ensure that a .CAB file is installed before the .EXE files from the .CAB file are run.
- Note that the auto-launch process can also launch batch files (***.BAT**), executable files (***.EXE**), registry setting files (***.REG**), or sound files (***.WAV**). The mechanism is the same as listed above, but the appropriate CE application is called, depending on file type.

Registry information is already in the default image for the following:

Registry information is already in the default image for the following:

```
; these keys load the appropriate radio driver
[HKEY_LOCAL_MACHINE\SOFTWARE\LXE\Persist\Summit Radio]
      "FileName"="\SYSTEM\SUMMIT.CAB"
      "Installed"=dword:1
      "FileCheck"="\WINDOWS\SDCCFG10G.DLL"
      "Order"=dword:02
      "Delay"=dword:0
      "PCMCIA"=dword:1

[HKEY_LOCAL_MACHINE\SOFTWARE\LXE\Persist\Cisco Radio]
      "FileName"="\SYSTEM\CISCO.CAB"
      "Installed"=dword:0
      "FileCheck"="\WINDOWS\CISCO.DLL"
      "Order"=dword:02
      "Delay"=dword:0
      "PCMCIA"=dword:1

[HKEY_LOCAL_MACHINE\SOFTWARE\LXE\Persist\Symbol Radio]
      "FileName"="\SYSTEM\SYMBOL.CAB"
      "Installed"=dword:0
      "FileCheck"="\WINDOWS\NICTT.EXE"
      "Order"=dword:02
      "Delay"=dword:0
```

```
        "PCMCIA"=dword:1
```

; this key loads the RFID driver (N/A to VX7)

```
[HKEY_LOCAL_MACHINE\SOFTWARE\LXE\Persist\RFID]
        "FileName"="\WINDOWS\RFID.CAB"
        "FileCheck"="\WINDOWS\RFID_WDG.DLL"
        "Order"=dword:12
```

; this key installs RFTERM from the CAB file

```
[HKEY_LOCAL_MACHINE\SOFTWARE\LXE\Persist\LXE TE]
        "FileName"="\SYSTEM\RFTERM.CAB"
        "Installed"=dword:0
        "FileCheck"="\WINDOWS\LXE\RFTERM.EXE"
        "Order"=dword:10
        "Delay"=dword:0
```

; this key runs RFTERM as a startup app

```
[HKEY_LOCAL_MACHINE\SOFTWARE\LXE\Persist\RFTERM]
        "FileName"="\WINDOWS\LXE\RFTERM.EXE"
        "Installed"=dword:0
        "FileCheck"="dummy"
        "Order"=dword:40
        "Delay"=dword:0
[HKEY_LOCAL_MACHINE\SOFTWARE\LXE\Persist\Java]
        "FileName"="\SYSTEM\JEODE.CAB"
        "Installed"=dword:0
        "FileCheck"="\WINDOWS\EVM.EXE"
        "Order"=dword:30
        "Delay"=dword:0
```

; this key installs APPLOCK from the CAB file

```
[HKEY_LOCAL_MACHINE\SOFTWARE\LXE\Persist\AppLockInstall]
        "FileName"="\SYSTEM\APPLOCK.CAB"
        "FileCheck"="\WINDOWS\APPLOCK.EXE"
        "Order"=dword:0
```

; this key runs the APPLOCK prep app

```
[HKEY_LOCAL_MACHINE\SOFTWARE\LXE\Persist\AppLockPrep]
        "FileName"="\SYSTEM\APPLOCKPREP.EXE"
        "FileCheck"="dummy"
        "Order"=dword:1
```

; this key runs the APPLOCK main app

```
[HKEY_LOCAL_MACHINE\SOFTWARE\LXE\Persist\AppLockInstall]
        "FileName"="\SYSTEM\APPLOCK.EXE"
        "FileCheck"="dummy"
        "Order"=dword:63
[HKEY_LOCAL_MACHINE\SOFTWARE\LXE\Persist\AUTOEXEC]
        "FileName"="\SYSTEM\AUTOEXEC.BAT"
        "Installed"=dword:0
        "FileCheck"="dummy"
        "Order"=dword:50
        "Delay"=dword:0
```

```
[HKEY_LOCAL_MACHINE\SOFTWARE\LXE\Persist\Avalanche]
      "FileCheck"="\\System\\avalanche\\model.dat"
      "Installed"=dword:00000000
      "PCMCIA"=dword:00000000
      "Delay"=dword:00000000
      "Order"=dword:00000004
      "FileName"="\\System\\LXEAVA.CAB"
[HKEY_LOCAL_MACHINE\SOFTWARE\LXE\Persist\AvaLaunch]
      "Order"=dword:00000005
      "FileName"="\\System\\Avalanche\\Avainit.exe"
      "FileCheck"="dummy"
      "Delay"=dword:00000000
      "PCMCIA"=dword:00000000
      "Installed"=dword:00000000
```

Registry entries may vary depending on software revision level and options ordered with the VX7.

LAUNCH.EXE and Persistent Storage

If any of the following directories are created in the \System folder, Launch automatically copies all of the files in these directories to the respective folder on the flash drive:

- AppMgr
- Desktop
- Favorites
- Fonts
- Help
- Programs
- Recent

Note: Files in the Startup folder are executed, but only from \System\Startup. They are not copied to another directory.

REGEDIT.EXE

Registry Editor – LXE recommends **caution** when editing the Registry and also recommends making a backup copy of the registry before changes are made.

REGLOAD.EXE

Double-tapping a registry settings file (e.g. REG) causes RegLoad to open the file and make the indicated settings in the registry. This is similar to how RegEdit works on a desktop PC. The .REG file format is the same as on the desktop PC.

REGDUMP.EXE

Registry dump – Saves a copy of the registry as a text file. The file, REG.TXT, is located in the root folder.

Note: The REG.TXT file is not saved in persistent storage. To use the REG.TXT file as a reference in the even of a coldboot, LXE recommends copying the file to the \SYSTEM directory on the VX7 or storing a copy of the file on a PC.

WARMBOOT.EXE

Double click this file to warm boot the computer (i.e., all RAM is preserved). It automatically saves the registry before rebooting which means configuration changes are not lost.

WAVPLAY.EXE

Double tapping a sound file (e.g. WAV) causes WavPlay to open the file and run it in the background.

VX7 Command-line Utilities

Command line utilities can be executed by **Start | Run |** [program name].

COLDBOOT.EXE

Command line utility which performs a cold boot (all RAM is erased).

Passwords are lost upon cold boot. If a password is set, that password must be entered to begin the cold boot power cycle process.

PrtScrn.EXE

Command line utility which performs a screen print and saves the file in .BMP format in the \System folder. Tap **Start | Run |** and type **prtscrn** and tap **OK**, or press **Enter**. There is a 10 second delay before the screen print is made. The device beeps and screen captured file (scrnnnnn.bmp) is placed in the \System folder. The numeric filename is incremented by 1 each time the PrtScrn function is activated. The command is not case-sensitive.

API Calls

See Also: LXE CE API Programming Guide E-SW-WINAPIPG

The LXE CE API Programming Guide documents only the LXE-specific API calls for the VX7. It is intended as an addition to the standard Microsoft Windows CE API documentation. Details of many of the calls in the LXE guide may be found in Microsoft's documentation.

The APIs documented in the programming guide are included in the file LXEAPI.DLL, which is in the standard Windows CE image on the VX7.

For ease of software development, the files LXEAPI.H and LXEAPI.LIB are available on the accessories CD, which are the C/C++ include files and the link library for the DLL, respectively. Note that this DLL is installed in VX7 images with a version number of 1.2 or higher (as displayed on the screen during bootup).

A full SDK is now included for Microsoft Embedded Visual C++ 4.0 (which is available free on the Microsoft website).

Reflash the VX7

Note: When reflashing, LXE recommends using a Compact Flash (CF) card that is greater than 64MB. Files to be loaded on the CF card are: NK.BIN, EBOOT.NB0, XSCALE.BIT

Requirements:

- A screwdriver (not supplied by LXE)
- PCMCIA to CF card adapter

Preparation

- LXE recommends that installation of the CF card be performed on a clean, well-lit surface.
- Loosen the captive screws securing the user access panel cover. The cover is tethered to the VX7.

How To: Reflash using Keypress Method

For information on identifying the platform version of your VX7, please see "Identifying your VX7" in Chapter 2, "Physical Description and Layout".

1. Place the PCMCIA adapter containing the CF card with new image files on it in the PCMCIA slot next to the radio.
2. Double-click **My Computer**, then **Storage Card** folder.
3. Select NK.BIN, EBOOT.NB0, XSCALE.BIT. Select **Edit | Copy**.
4. Tap **Back Arrow**. Doubleclick **\System** folder.
5. Select **Edit | Paste**. When asked "Overwrite ?", click **Yes to All**.
6. When the copy process finishes, remove the he PCMCIA adapter containing the CF card.
7. Select **Start | Run** and type **Coldboot**.
8. Select one of the options below, as appropriate:

Platform 1 VX7's

- Wait for the "Loading system from ATA" toolbar to appear. When it does, press and release the Power button. When the "Press power switch again for confirmation" message appears, the Power button must be pressed and released in the next three seconds to confirm the reload. If the Power button is not pressed during the three second period, the operating system resumes loading.

Platform 2 VX7's:

- Wait for the "Loading system from ATA" toolbar to appear. When it does, press and release the "A" key. When the "confirmation" message appears, "Y" key must be pressed and released in the next three seconds to confirm the reload. If the "Y" key is not pressed during the three second period, the operating system resumes loading.

9. The VX7 automatically reboots after flashing the bootloader. “Loading OS Image” is displayed on the screen and when the new OS finishes loading, all software upgrades are complete.
10. Secure the user access cover using the captive screws. The touchscreen must be re-calibrated.

How To: Reflash using TAG file Method

This method requires software revision 2BT or greater. To identify the software revision, please click on the “About” icon in the CE .NET Control Panel.

1. Place the PCMCIA adapter containing the CF card with new image files on it in the PCMCIA slot next to the radio.
2. Double-click **My Computer**, then **Storage Card** folder.
3. Select NK.BIN, EBOOT.NB0, XSCALE.BIT. Select **Edit | Copy**.
4. Tap **Back Arrow**. Doubleclick **\System** folder.
5. Select **Edit | Paste**. When asked “Overwrite ?”, click **Yes to All**.
6. Additionally a REFLASH.TAG file is needed to trigger the reflash. This file can be created on the VX7 or copied to it along with the system files. The contents of the file are unimportant; but the file must be named REFLASH.TAG and it must be in the **\System** folder with the new system load.
7. When the copy process finishes, remove the he PCMCIA adapter containing the CF card.
8. Select **Start | Run** and type **Coldboot**.
9. When booting, the VX7 looks for a file named REFLASH.TAG in the \System folder.
    - When this file is encountered, the VX7 loads a new bootloader image (eboot.nb0) into the boot flash. The tag file is deleted and the VX7 is rebooted to begin using the new boot loader.
    - If EBOOT detects this file, a re-flash sequence is initiated. The .TAG file is deleted and the VX7 reboots.
    - If EBOOT detects the REFLASH.TAG file and there is no .nb0 file it does not re-flash and deletes the REFLASH.TAG file to prevent an endless cycle.
10. The VX7 automatically reboots after flashing the bootloader. “Loading OS Image” is displayed on the screen and when the new OS finishes loading, all software upgrades are complete
11. Secure the user access cover using the captive screws. The touchscreen must be re-calibrated.

Clearing Persistent Storage

The coldboot utility sets all registry settings back to LXE factory defaults. No other clearing is available or necessary.

Keyboard Backlighting

This VX7 keyboards illuminate the individual keys

60-Key Keyboard

The keyboard is manually controlled by pressing <2nd> + <CTRL> + <F10> when using the 60-key keyboard. This key sequence immediately changes the state of the keyboard backlight as follows:

- Turns the backlight Off if it is currently On.
- Turns the backlight On if it is currently Off.

95-Key Keyboard

The keyboard backlight is manually controlled using the "backlight" key in the upper right hand corner of the keyboard. Pressing the backlight key cycles the keyboard backlight through the levels of backlight intensity:

- Off
- Maximum intensity
- Medium intensity
- Low intensity.

Changing the Display Resolution

The display resolution can only be changed on Platform 2 VX7's. For more information on identifying the platform version of your VX7, please see "Identifying your VX7" in Chapter 2, "Physical Description and Layout".**Error! Bookmark not defined.Error! Bookmark not defined.**

The default resolution of the VX7 display is 800 x 600 pixels. An optional resolution of 640 x 480 pixels is supported.

To change the display resolution to 640 x 480 pixels, run \Windows\dvx7_640x480.reg and perform a warmboot.

To change the display resolution to 800 x 600 pixels, run \Windows\dvx7_800x600.reg and perform a warmboot.

Note: These utilities configure the display resolution on warmboot. After a coldboot, the default resolution of 800 x 600 pixels is enabled.

Disabling the Touchscreen

To disable the touchscreen, run \Windows\TouchDisable.reg and perform a warmboot.

To enable the touchscreen, run \Windows\TouchEnable.reg and perform a warmboot.

Note: These utilities affect the behavior of the touchscreen on warmboot. After a coldboot, the touchscreen is enabled.

Disabling the Touchscreen Heater

The touchscreen heater can only be disabled on Platform 2 VX7's. For more information on identifying the platform version of your VX7, please see "Identifying your VX7" in Chapter 2, "Physical Description and Layout".

The touchscreen heater installed in extended temperature VX7's may be disabled.

To disable the touchscreen heater, run \Windows\HeaterDisable.reg and perform a warmboot.

To enable the touchscreen heater, run \Windows\HeaterEnable.reg and perform a warmboot.

Note: These utilities affect the behavior of the touchscreen heater on warmboot. After a coldboot, the touchscreen heater is enabled.

Configuring NumLock Behavior

To set NumLock status to On after a warmboot, run \Windows\NumLockOn.reg and perform a warmboot.

To set NumLock status to Off after a warmboot, run \Windows\NumLockOff.reg and perform a warmboot.

Note: The current status of NumLock can be changed with the <2nd> <SHIFT> <F10> keypress sequence, however this method does not change NumLock behavior upon reboot.

Note: These utilities affect the behavior of the NumLock on warmboot. After a coldboot, NumLock is enabled.

Configuring CapsLock Behavior

The CapsLock behavior can only be changed on VX7's with software revision 1ED or greater. For more information on identifying the software version of your VX7, please see "Identifying your VX7" in Chapter 2, "Physical Description and Layout".

To set CapsLock status to On after a warmboot, run \Windows\CapsLockOn.reg and perform a warmboot.

To set CapsLock status to Off after a warmboot, run \Windows\CapsLockOff.reg and perform a warmboot.

Note: Setting CapsLock to On using this method does not display the CapsLock icon in the Windows CE taskbar,

Note: The current status of CapsLock can be changed with the CapsLock key (95-key keyboard) or the CAPS key (60—key keyboard), however this method does not change CapsLock behavior upon reboot.

Note: These utilities affect the behavior of the CapsLock on warmboot. After a coldboot, CapsLock is disabled.

Configuring IPv6

The ability to disable IPv6 is only present on VX7's with software revision 1ED or greater. For more information on identifying the software version of your VX7, please see "Identifying your VX7" in Chapter 2, "Physical Description and Layout".

By default, IPv6 is enabled and an IPv6 broadcast message is sent on power up.

To disable IPv6, run \Windows\ipv6Disable.reg and perform a warmboot.

To enable IPv6, run \Windows\ipv6Enable.reg and perform a warmboot.

Note: These utilities affect the behavior of IPv6 on warmboot. After a coldboot, IPv6 is enabled.

Enabling GrabTime

The ability to enable GrabTime to run automatically is only present on VX7's with software revision 2BT or greater. For more information on identifying the software version of your VX7, please see "Identifying your VX7" in Chapter 2, "Physical Description and Layout".

The VX7 has a GrabTime utility which can be used to synchronize the VX7 with a time server (via an Internet connection) at boot up.

By default, GrabTime does not run automatically.

To enable GrabTime to run automatically at start up, run \Windows\tmsync.reg and perform a warmboot. For more detail, see "LAUNCH.EXE", earlier in this chapter.

Note: These utility affects the behavior of GrabTime warmboot. After a coldboot, GrabTime is disabled.

GrabTime can also executed manually by using the Sync button on the Date/Time control panel. See "Date/Time", earlier in this chapter, for more details.

Network Configuration

There are two networking options available for the VX7:

- 2.4GHz wireless radios
- Ethernet (RJ-45) connector.

2.4 GHz Wireless Radios

Please refer to the appropriate section earlier in this chapter for configuring the Summit, Cisco or Symbol radio.

Ethernet Connector

When the VX7 is networked using the Ethernet connector, the VX7's networking options are set via the Microsoft Windows CE .NET Control Panel.

For more information on configuring the Microsoft Windows CE .NET network settings, please refer to the Help feature or commercially available Windows CE .NET networking literature.

Chapter 5 Wireless Network Configuration

Introduction

The VX7 computer offers a choice of Summit, Cisco or Symbol radios. The Summit radio is an 802.11g radio. The Cisco and Symbol radios are 802.11b radios. The radio can be configured for no encryption, WEP encryption or WPA security (N/A with Symbol radio).

Certificates are necessary for many of the WPA authentications. Please refer to the "Certificates" section at the end of this chapter for more information on generating and installing certificates.

Please refer to the table below for the security options supported for each radio type.

Security Options Supported	Radio Type		
	Summit	Cisco	Symbol
None	Yes	Yes	Yes
WEP	Yes	Yes	Yes
LEAP	Yes	Yes	Yes
WPA-PSK	Yes	Yes	No
WPA/LEAP	Yes	Yes	No
PEAP-MSCHAP	Yes	Yes	No
PEAP-GTC	No	Yes	No
EAP-TLS	No	Yes	No

Summit Radio

S	The Summit radio requires software revision 2BT or greater. All VX7's with a Summit radio ship with this software revision or greater. To identify the software revision, please click on the "About" icon in the CE .NET Control Panel.
	Please refer to the "LXE Security Primer" to prepare the Authentication Server and Access Point for VX7 communication.
Date/Time	It is important that all dates are correct on CE computers when using any type of certificate. Certificates are date sensitive and if the date is not correct authentication will fail.

The Summit radio is an 802.11g radio, capable of both 802.11b and 802.11g data rates. This radio supports no encryption, WEP, LEAP or WPA (PEAP-MSCHAP, WPA/LEAP and WPA-PSK).

Summit Client Utility

Note: When making changes to profile parameters, the VX7 should be warmbooted afterwards.

Access: Start | Programs | Summit | SCU *or* SCU Icon on Desktop

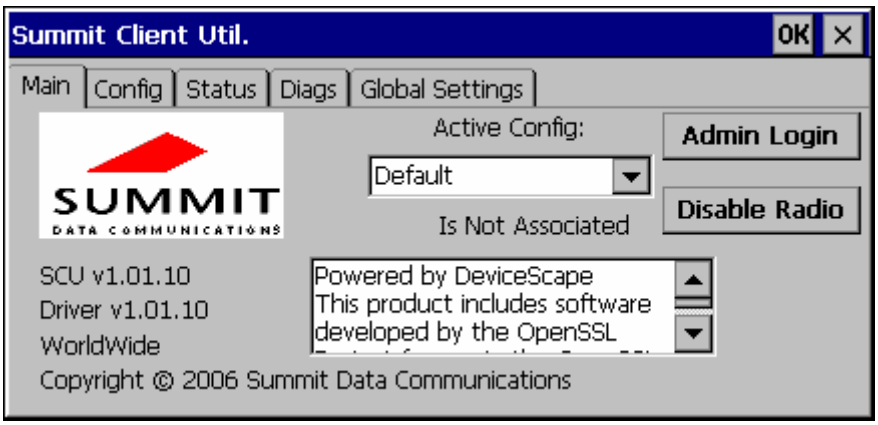


Figure 5-1 Summit Client Utility

The **Main** tab provides information, admin login and active config (profile) selection.

Profile specific parameters are found on the **Config** tab. The parameters on this tab can be set to unique values for each profile.

The **Status** tab contains information on the current connection.

The **Diags** tab provides utilities to troubleshoot the radio.

Global parameters are found on the **Global Settings** tab. The values for these parameters apply to all profiles.

Wireless Zero Config Utility and the Summit Radio

- The WZC utility has an icon in the toolbar that looks like networked computers with a red X through them, indicating that Wireless Zero Config application is enabled but the connection is inactive at this time (the VX7 is not connected to a network).
- You can use either the Wireless Zero Configuration Utility or the Summit Client Utility to connect to your network.

Select **ThirdPartyConfig** in the Active Config drop down list as the active profile. Warmboot the VX7. The Summit Client Utility passes control to Wireless Zero Config and the WZC Wireless Information control panel. Using the options in the Wireless Zero Config panels, setup radio and security settings.

To switch back to Summit Client radio control, select any other profile in the SCU Active Config drop down list, except ThirdPartyConfig. Warmboot the VX7. Radio control is passed to the SCU.

Main Tab

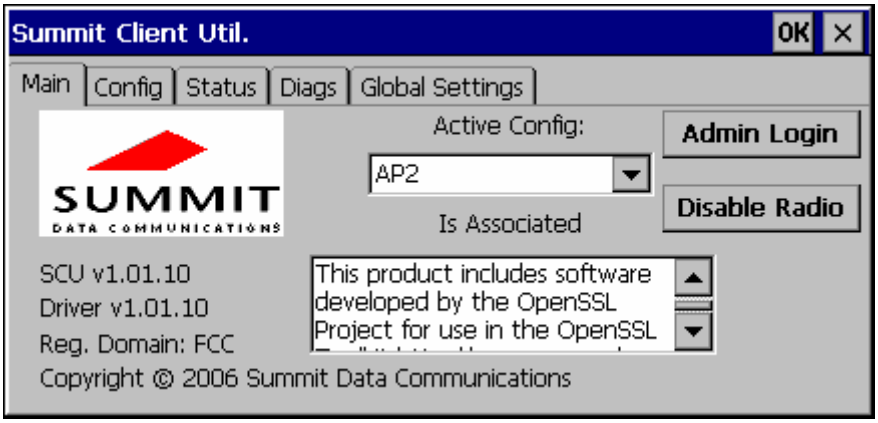


Figure 5-2 SCU – Main Tab

The Main tab displays information about the radio including:

- SCU (Summit Client Utility) version
- Driver version
- Regulatory Domain
- Copyright Info
- Active Config (profile) – Select from the profiles created using the Config tab.
- Status of the radio (Down, Associated, etc).

The **Disable Radio** button can be used to disable the radio card. Once disabled, the button label changes to **Enable Radio**. By default, the radio is enabled.

The **Admin Login** button provides access to editing radio parameters as well as adding, renaming and deleting profiles. Config and Global parameters may only be edited after entering the Admin Login password. The Active Config may be changed without logging in. Once logged in, the button label changes to **Admin Logout**. The admin is also automatically logged out when the SCU is exited.

Admin Login

To login to Admin mode, click the Admin login button.

Figure 5-3 Admin Password Entry

Enter the Admin password and press OK. If the password is incorrect, an error message is displayed. The default password is SUMMIT.

Note: The password is case sensitive!

The Admin password can be changed on the Global Settings tab.

The end user can:

- View the current parameter settings for the profiles on the Config tab
- View the global parameter settings on the Global Settings tab.
- The current connection details on the Status tab
- Radio status, software versions and regulatory domain on the Main tab

After Admin login, the use can also:

- Turn radio On/Off on the Main tab
- Select active Config (Profile) on the Main tab
- Create, edit, rename and delete profiles on the Config tab
- Edit global parameters on the Global Setting tabs
- Access additional troubleshooting features on the Diags tab.

Config Tab

Note: If the Admin password is not entered, the user can view the config parameter settings but cannot make any changes. The buttons on this tab are grayed out if the user is not logged in.

Figure 5-4 SCU – Config Tab

When logged in as an Admin (see the Main tab), use the Config tab to manage profiles:

- **Rename** – Gives the profile a new, unique name. If the new name is not unique, an error message is displayed and the profile is not renamed.
- **Delete** – Deletes the profile. The current active profile cannot be deleted. In that case, an error message is displayed and the profile is not deleted.
- **New** – Creates a new profile with the default settings (see the table below) and prompts for a name. The name must be unique. If not, an error message is displayed and the profile is not created.
- **Commit** – Ensures that the profile settings made on this screen are saved in the profile.

When not logged in, the parameters can be viewed, but cannot be changed.

Parameters

IMPORTANT – Remember to click the **Commit** button after making changes to ensure the changes are saved.

Config

A string of 1 to 32 alphanumeric characters, name of the Config or Profile

Default: Default

SSID

A string of up to 32 alphanumeric characters, the Service Set Identifier (SSID) of the WLAN to which the radio connects

Default: Blank

Client Name

A string of up to 16 characters – Name assigned to the radio and the device using the radio. The client name may be passed to networking radio devices, e.g. Access Points.

Default: Blank

Power Save

Power save mode.

Options: CAM = Constantly Awake Mode, power save off

Default: CAM

Tx Power

Desired transmit power.

Options: Maximum = Max power for current regulatory domain
50, 30, 10 or 1 mW

Default: Maximum

Bit Rate

Options: Auto = Rate negotiated automatically with the AP
1, 2, 5.5, 6, 9, 11, 12, 18, 24, 36, 48 or 54 Mbit

Default: Auto

Radio Mode

Specify 802.11g and/or 802.11b when communicating with AP.

Options: B rates only
B + G rates

Default: B + G rates

Auth Type

802.11 authentication type used when associating with AP

Options: Open
Shared key
LEAP

Default: Open

Note: Set the Auth Type radio parameter is set to "Open" for all configurations unless using LEAP (not WPA) and the AP is configured for network EAP only. In this case, set the Auth Type radio parameter to "LEAP".

EAP Type

Extensible Authentication Protocol (EAP) type used for 802.1x authentication to AP

Options: None
LEAP
EAP-FAST
PEAP-MSCHAP
PEAP-GTC
EAP-TLS

Default: None

Note: The EAP type chosen determines if the **Credentials** *button is active. Available entries on the Credentials pop up window vary by EAP type chosen.*

Encryption

Type of encryption used to protect transmitted data.

Options: None
Manual WEP
Auto WEP
WPA PSK
WPA TKIP
WPS2 PSK
WPA2 TKIP
WPA2 AES
CCKM TKIP
CCKM AES

Default: None

Note: The Encryption type chosen determines if the **WEP/PSK Keys** *button is active. Available entries on the pop up window vary by encryption type chosen.*

IMPORTANT – The settings for Auth Type, EAP Type and Encryption depend on the security type chosen. Please refer to "Summit Wireless Security", later in this chapter, to determine the proper settings for the security type implemented on the wireless LAN.

Status Tab

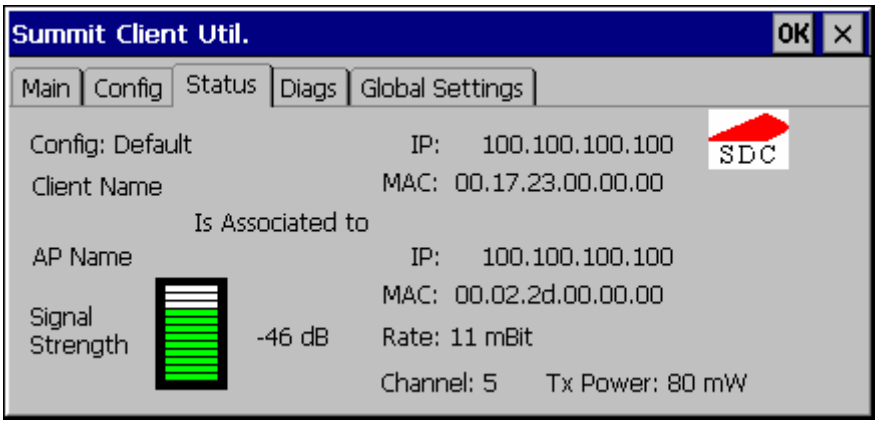


Figure 5-5 SCU – Status Tab

This screen provides information on the radio:

- The config profile being used
- The client name, IP address and MAC address
- The status of the radio card (down, associated, etc.)
- The name, IP address and MAC address of the Access Point (AP) maintaining the connection to the network
- Signal strength (changes with network activity)
- Channel currently being used for wireless traffic
- Current transmit power in mW
- Bit rate in Mbit.

There are no user entries on this screen.

Diags Tab

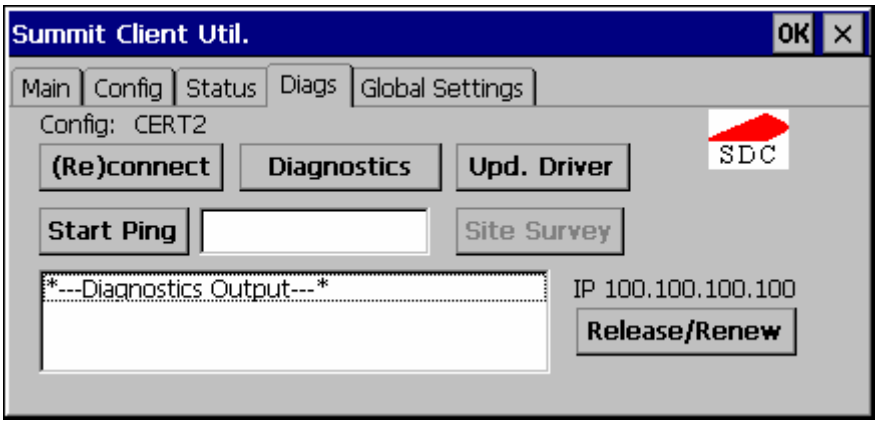


Figure 5-6 SCU – Diags Tab

The Diags screen can be used for troubleshooting network traffic and radio connectivity issues.

- **(Re)connect** – Use this button to apply (or reapply) the current config profile and attempt to associate or authenticate to the wireless LAN. All activity is logged in the Diagnostic Output box on the lower part of the screen.
- **Diagnostics** – Also attempts to (re)connect to the wireless LAN. However, this option provides more data in the Diagnostic Output box than the (Re)connect option. This data dump includes radio state, profile settings, global settings, and a list of broadcast SSID APs. (Not available in this release)
- **Upd. Driver** – Use this button to update the radio driver. (Not available in this release)
- **Start Ping** – Start a continuous ping to the IP address specified in the text box to the right of this button. Once the button is clicked, the ping begins and the button label changes to **Stop Ping**. Clicking the button ends the ping. The ping also ends when any other button on this screen is clicked or the user browses away from the Diags tab. The results of the ping are displayed in the Diagnostic Output box.
- **Site Survey** – (Not available in this release)
- **Release/Renew** – Obtain a new IP address through release and renew. All activity is logged in the Diagnostic Output box. If a fixed IP address has been assigned to the radio, this is also noted in the Diagnostic Output box. Note that the current IP address is displayed above this button.

Global Settings Tab

The parameters on the global settings tab can be changed when an Admin is logged on. Without the admin login, the current values for the parameters can be viewed, but they cannot be edited.

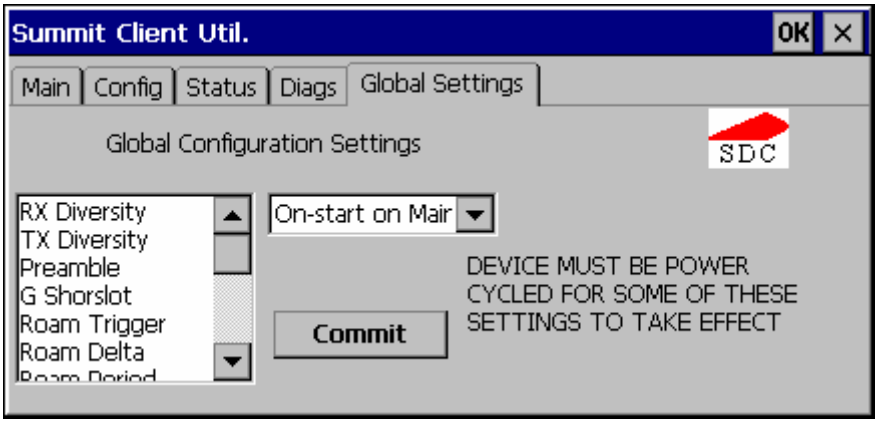


Figure 5-7 SCU – Global Settings Tab

Parameters

IMPORTANT – Remember to click the **Commit** button after making changes to ensure the changes are saved.

RX Diversity

How to handle antennas diversity when receiving packets from AP.

Options: Main Only = use main antenna only
Aux Only = use aux. antenna only
On-start on Main = On startup use main antenna
On-start on Aux = On startup use aux antenna

Default: On-start on Main

⚠	For a VX7 with a single external antenna, use **Main Only**. For a VX7 with either dual external antennas or an internal antenna, use **On-start on main**.

TX Diversity

How to handle antenna diversity when transmitting packets to AP.

Options: Main only = Main antenna only
Aux only = Aux antenna only
On = Use diversity

Default: On

⚠	For a VX7 with a single external antenna, use **Main Only**. For a VX7 with dual external antennas or an internal antenna, use **On**.

Preamble

Type of radio preamble or header for packets.

Options: Auto, Short, Long

Default: Auto

G Short Slot

802.11g short slot timing mode.

Options: Auto, On, Off

Default: Auto

Roam Trigger

If signal strength is less than this trigger value, the radio looks for a different AP with a stronger signal.

Options: -50, -55, -60, -65, -70, -75 dBm

Default: -65 dBm

Roam Delta

Amount by which the new AP's signal strength must exceed the current AP's signal strength before roaming is attempted.

Options: 5, 10, 15, 20, 25, 30, 35 dBm

Default: 10 dBm

Roam Period

The amount of time to be used to collect signal strength information from an AP before a roaming decision is made.

Options: 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 50 sec

Default: 10 seconds

Frag Thresh

If the packet size (in bytes) exceeds the specified number of bytes set in the fragment threshold, the packet is fragmented (sent as several pieces instead of as one block). Use a low setting in areas where communication is poor or where there is a great deal of radio interference.

Options: 256 to 2346

Default: 2346

RTS Thresh

If the packet size exceeds the specified number of bytes set in the Request to Send (RTS) threshold, an RTS is sent before sending the packet. A low RTS threshold setting can be useful in areas where many client devices are associating with the Access Point.

Options: 0 to 2347

Default: 2347

Ping Payload

Maximum amount of data to be transmitted on a ping.

Options: 32, 64, 128, 256, 512, 1024 bytes

Default: 32

Ping Timeout ms

The amount of time, in milliseconds, that a device will be continuously pinged. The Stop Ping button can be tapped to end the ping process ahead of the ping timeout.

Options: 0 to 30,000 ms

Default: 5000

Ping Delay ms

The amount of time, specified in milliseconds, between each ping.

Options: 0 to 30,000 ms

Default: 1000

LED

The LED on the radio card is not visible to the user when the radio card is installed in a sealed mobile device.

Options: On, Off

Default: Off

Hide Password

If On, the Summit Client Utility masks passwords as they are typed and when they are viewed.

Options: On, Off

Default: On

Admin Password

A string of up to 64 alphanumeric characters that must be entered when the Admin Login button is tapped. If Hide Password is On, the password is masked when typed in the Admin Password Entry text box. The password is Case Sensitive.

Default: SUMMIT

Note: Password is case sensitive.

Certs Path

A valid directory path, of up to 64 characters, where WPA Certificate Authority and User Certificates are stored on the mobile device. LXE suggests ensuring the directory path currently exists before assigning the path in this parameter. See sections titled “Root Certificates” and “User Certificates” later in this chapter for instructions on obtaining CA and User Certificates.

Default: System

Summit Wireless Security

Use the instructions in this section to complete the entries on the **Config** tab according to the type of wireless security used by the network. The instructions that follow are the minimum required to successfully connect to a network. Your system may require more parameters than are listed in these instructions. Please see your system administrator for complete information about your network and its wireless security requirements.

To begin the configuration process:

- On the Main tab, click the **Admin Login** button and enter the password.
- LXE recommends editing the default profile with the parameters for your network. Select the Default profile from the pull down menu.

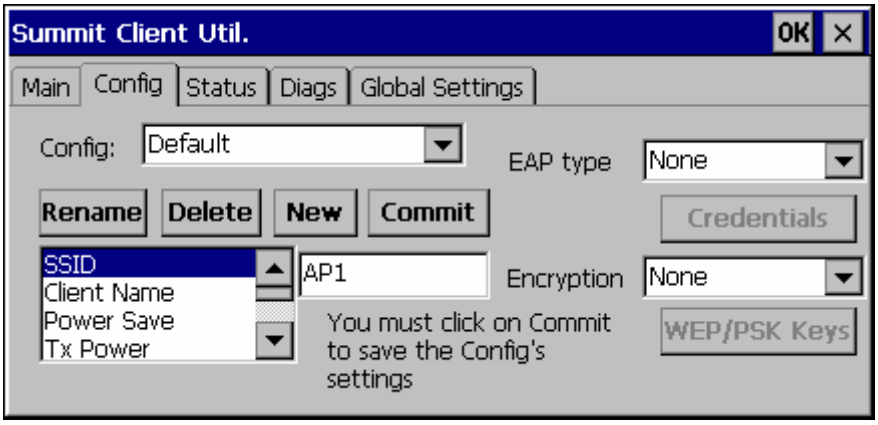


Figure 5-8 Default Config (Profile)

- Make any desired parameter changes as described in the applicable following section determined by network security type and click the **Commit** button to save the changes.

Be sure to click the **Commit** button after all changes have been made.

No Security

To connect to a wireless network with no security, make sure the following profile options are used:

- Enter the SSID of the Access Point assigned to this profile
- Set EAP Type to None
- Set Encryption to None
- Set Auth Type to Open

Figure 5-9 No Security

Once configured, click the **Commit** button. Ensure the correct Active Config is selected on the Main tab and warmboot. The SCU Main tab shows the device is associated after the radio connects to the network.

WEP

To connect using WEP, make sure the following profile options are used.

- Enter the SSID of the Access Point assigned to this profile
- Set EAP Type to None
- Set Encryption to Manual WEP
- Set Auth Type to Open

Figure 5-10 WEP Encryption

Click the **WEP/PSK Keys** button.

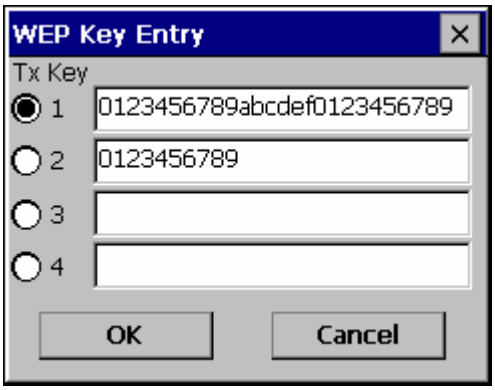


Figure 5-11 WEP Keys

Valid keys are 10 (for 40 bit encryption) or 26 (for 128 bit encryption) hexadecimal characters. Enter the key(s) and click **OK**.

Once configured, click the **Commit** button. Ensure the correct Active Config is selected on the Main tab and warmboot. The SCU Main tab shows the device is associated after the radio connects to the network.

LEAP without WPA Authentication

To use LEAP (without WPA) make sure the following profile options are used:

- Enter the SSID of the Access Point assigned to this profile
- Set EAP Type to LEAP
- Set Encryption to Auto WEP
- Set Auth Type as follows:
  - If the Cisco/CCX certified AP is configured for open authentication, set the Auth Type radio parameter to “Open”.
  - If the AP is configured for network EAP only, set the Auth Type radio parameter to “LEAP”.

Please see “WPA/LEAP” later in this section to configure the radio for WPA LEAP.

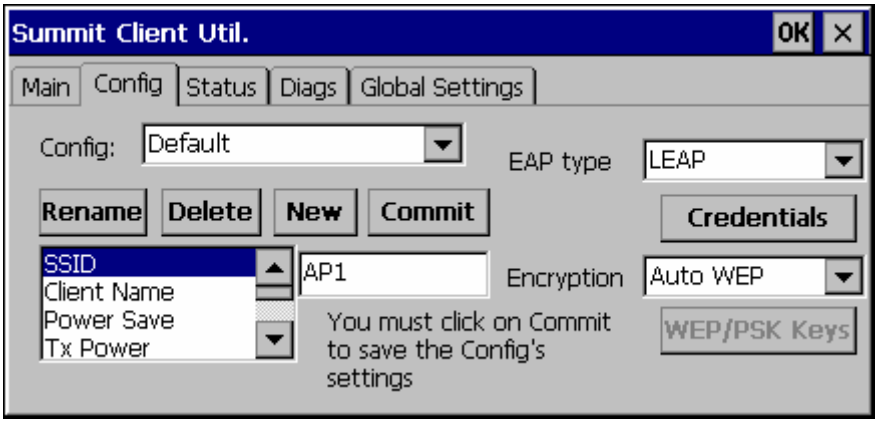


Figure 5-12 LEAP Configuration

Click on the **Credentials** button.

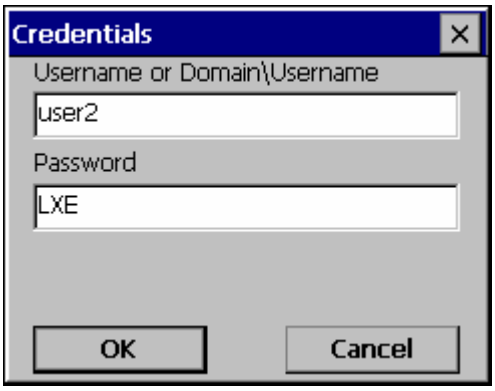


Figure 5-13 LEAP Credentials

Enter the Domain\Username (if the Doman is required), otherwise enter the Username. Enter the password and click **OK**.

Once configured, click the **Commit** button. Ensure the correct Active Config is selected on the Main tab and warmboot. The SCU Main tab shows the device is associated after the radio connects to the network.

PEAP/MSCHAP

To use PEAP/MSCHAP, make sure the following profile options are used.

- Enter the SSID of the Access Point assigned to this profile
- Set EAP Type to PEAP-MSCHAP
- Set Encryption to WPA TKIP
- Set Auth Type to Open

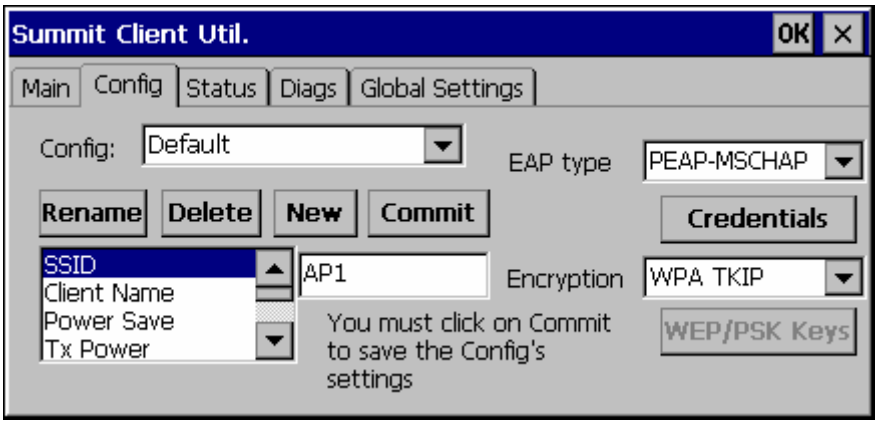


Figure 5-14 PEAP/MSCHAP

Click **Credentials** button.

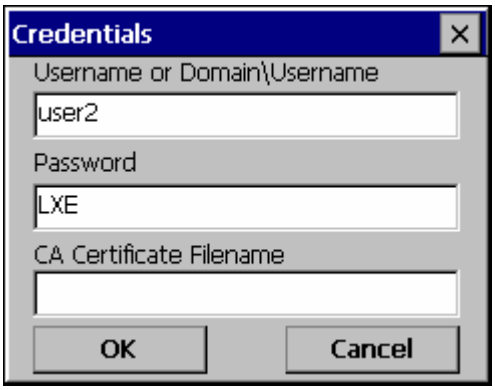


Figure 5-15 PEAP/MSCHAP Credentials

Enter the Domain\Username (if the Doman is required), otherwise enter the Username.

Enter the password.

Leave the CA Certificate File Name blank for now.

Click **OK** then click **Commit**. Ensure the correct Active Config is selected on the Main tab.

Once successfully authenticated, copy the CA certificate into the \System directory of the device. Once the file is in the \System directory, enter the file name in the CA Certificate Filename text box.

For information on generating a Root CA certificate, please see "Generating a Root CA Certificate" later in this chapter. When using the Summit radio, copy the certificate into the \System folder rather than following the process in "Installing a Root CA Certificate".

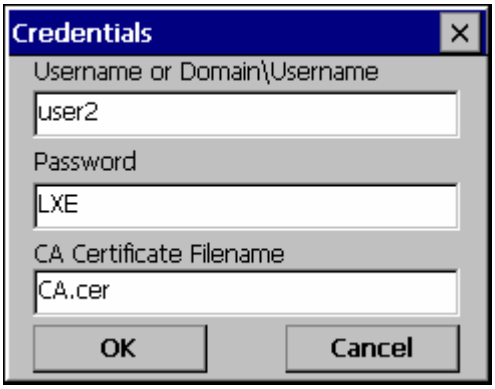


Figure 5-16 PEAP/MSCHAP Certificate Filename

Click **OK** then click **Commit**.

The device should be authenticating the server certificate and using PEAP/MSCHAP for the user authentication.

Note: The date must be properly set on the device to authenticate a certificate.

WPA/LEAP

To use WPA/LEAP, make sure the following profile options are used.

- Enter the SSID of the Access Point assigned to this profile
- Set EAP Type to LEAP
- Set Encryption to WPA TKIP
- Set Auth Type to Open

Please see "LEAP" earlier in this section to configure the radio for LEAP without WPA.

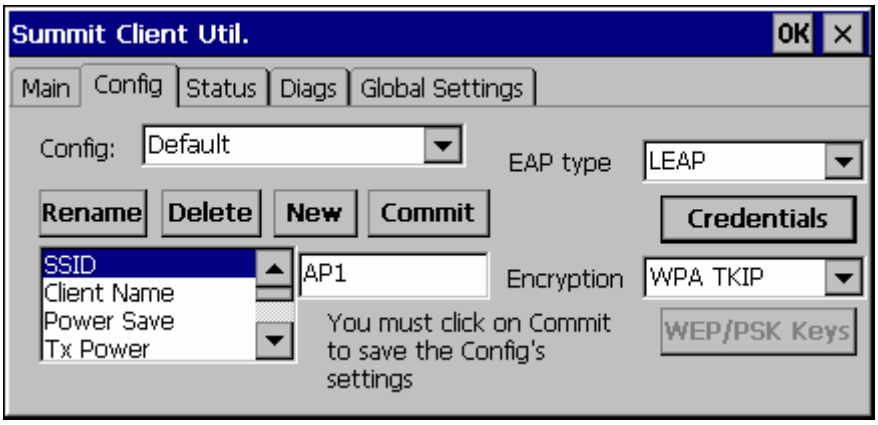


Figure 5-17 WPA/LEAP

Click on the **Credentials** button.

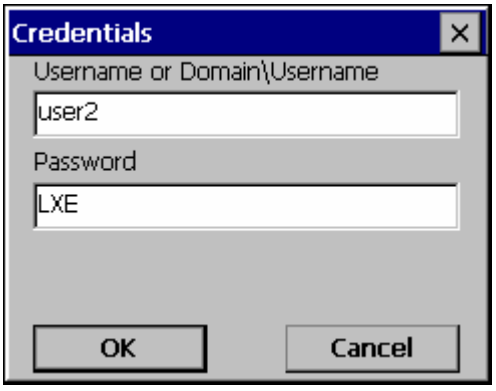


Figure 5-18 WPA/LEAP Credentials

Enter the Domain\Username (if the Doman is required), otherwise enter the Username.

Enter the password.

Click **OK** then click **Commit**. Ensure the correct Active Config is selected on the Main tab and warmboot. The SCU Main tab shows the device is associated after the radio connects to the network.

WPA PSK

To connect using WPA/PSK, make sure the following profile options are used:

- Enter the SSID of the Access Point assigned to this profile
- Set EAP Type to None
- Set Encryption to WPA PSK
- Set Auth Type to Open

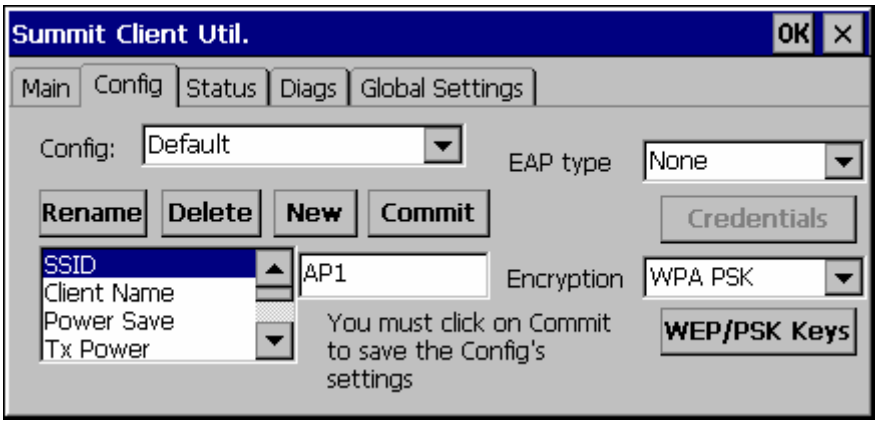


Figure 5-19 WPA/PSK Encryption

Click **WEP/PSK Keys** button.

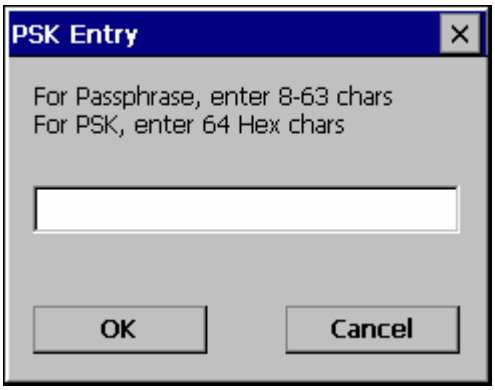


Figure 5-20 PSK Entry

This value can be 64 hex characters or an 8 to 63 byte ASCII value. Enter the key and click **OK**.

Once configured, click the **Commit** button. Ensure the correct Active Config is selected on the Main tab and warmboot. The SCU Main tab shows the device is associated after the radio connects to the network.

Cisco Radio

The Cisco radio is a 2.4GHz 802.11b radio. This radio supports no encryption, WEP, LEAP or WPA (PEAP-MSCHAP, PEAP-GTC, EAP-TLS, WPA/LEAP and WPA-PSK).Configuring without WPA

Cisco – Aironet Client Utility (ACU)

Note: When making changes to profile parameters, the VX7 should be warmbooted afterwards.

Access: Start | Programs | Cisco ACU *or* ACU Icon on Desktop

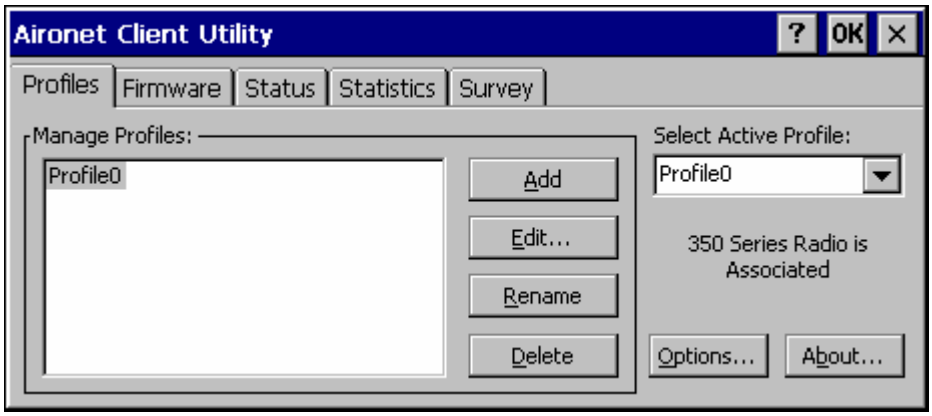


Figure 5-21 Cisco Aironet Client Utility

Note: To configure WPA, please see "Configuring for WPA", later in this section.

Profiles Tab

Use this option to manage profiles and review firmware information, status, statistics and wireless radio survey data.

Profile Parameter	Default
SSID	Blank
Client Name	Blank
Infrastructure Mode	Yes
Power Save Mode	Fast PSP
Network Security Type	None
WEP	No WEP
Authentication Types	Open
LEAP	Disabled
Mixed Mode	Disabled
World Mode	Disabled
Data Rates	Auto
Transmit Power	MAX
Offline Channel Scan	Enabled

Select an active profile to manage.

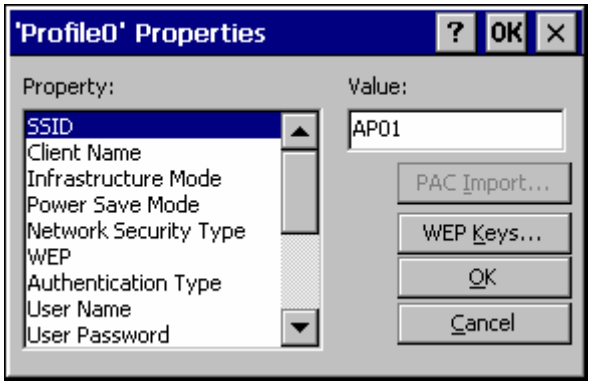


Figure 5-22 Cisco Profile Properties Screen

No Security

Create a new profile or edit an exiting profile.

- If no security is used, the only entry necessary on the Profile Properties screen may be the SSID. If the SSID is left blank, the radio can associate to any available network.
- Network security must be set to None.
- WEP must be set to No WEP.

WEP

To use WEP, create a new profile or select an exiting profile.

- WEP must be set to either Static WEP keys or Dynamic WEP keys. When one of the WEP methods is selected, the WEP Keys button is active.
- Authentication must be set to Open
- The appropriate WEP keys must be entered:
  - 40-bit WEP keys consist of 10 hexadecimal characters of 5 ASCII characters
  - 128 bit WEP keys consist of 26 hexadecimal or 13 ASCII characters.
  - After a WEP key is entered, it will be hidden from view if you return to the screen. However, the "Already Set" indicates if a key has previously been entered.

Tap the WEP Keys button to enter WEP information. If a key is already entered, the Already set? Checkbox is checked. The previously entered key value is not displayed for security.

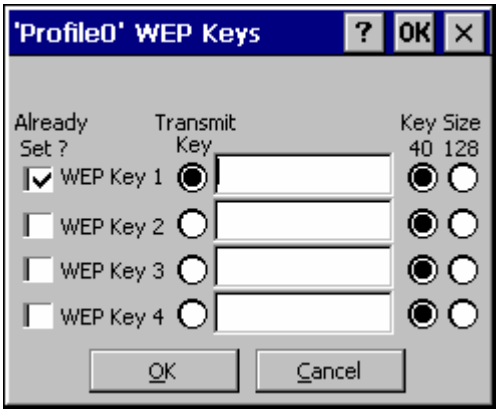


Figure 5-23 Cisco Profile WEP Keys

LEAP

Note: The instructions in this section are for LEAP without WPA. Please see WPA/LEAP later in this chapter for instructions on using LEAP with WPA.

Create a new profile or edit an exiting profile.

- Network security must be set to LEAP.
- The following parameters are accessible when LEAP is selected. Please enter the appropriate information.
  - User Name
  - User Password
  - User Domain (optional)

Firmware Tab

Displays the current firmware version and allows you to load new firmware. Tap the Browse button to locate the new firmware file.

Status Tab

Immediately runs status on : signal strength and signal quality.

Statistics Tab

Select the Receive Stats or Transmit Stats. The data is displayed on the screen.

Survey Tab

Immediately runs signal strength and quality and link speed. An option is available to Setup parameters for Active Mode reporting.

Configuring for WPA

	Wi-Fi Protected Access (WPA) is only available on VX7's equipped with the updated Cisco radio driver (release 2.60 or later).
	WPA requires software revision 1ED or greater. To identify the software revision, please click on the "About" icon in the CE .NET Control Panel.
	Please refer to the "LXE Security Primer" to prepare the Authentication Server and Access Point for VX7 communication.
Date/Time	It is important that all dates are correct on CE computers when using any type of certificate. Certificates are date sensitive and if the date is not correct authentication will fail.

System Requirements

To support Wi-Fi Protected Access (WPA), the VX7 must be equipped as follows:

- Cisco 350 radio card with driver release 2.60 (or later).

The LXE VX7 supports WPA and all authentications. The Microsoft supplicant and Cisco supplicants are used separately or together to provide support for the different authentications.

Most of the configuration is done with the Microsoft Wireless Configuration tool WPA/LEAP requires the Cisco supplicant and configuration tool.

Installing Radio drivers

Which version of the Cisco driver should be installed depends on what authentication protocol is to be configured.

- Cisco PEAP should not be installed if using PEAP/MSCHAP.
- Cisco PEAP must be installed if using PEAP/GTC.
- For all other authentications (LEAP, EAP-TLS, WPA-PSK) it does not matter if Cisco PEAP is installed or not.

To determine if Cisco PEAP is installed or to change the installation, follow the instructions below.

Checking for the Cisco PEAP Supplicant

With a Cisco radio installed, open the Wireless network properties as described in "Wireless Network Configuration", later in this chapter. With the Authentication tab selected check the text in the EAP type drop down box. Refer to the following figures to determine if Cisco PEAP is installed.

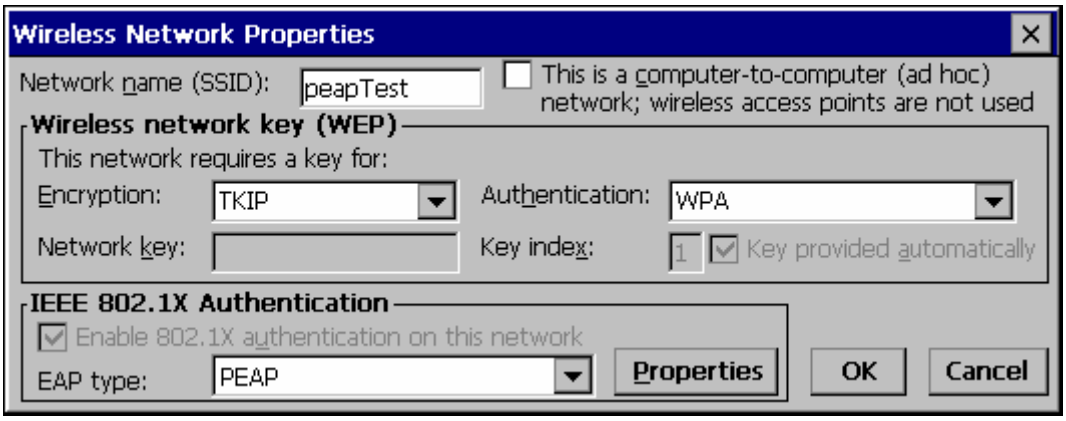


Figure 5-24 No Cisco PEAP

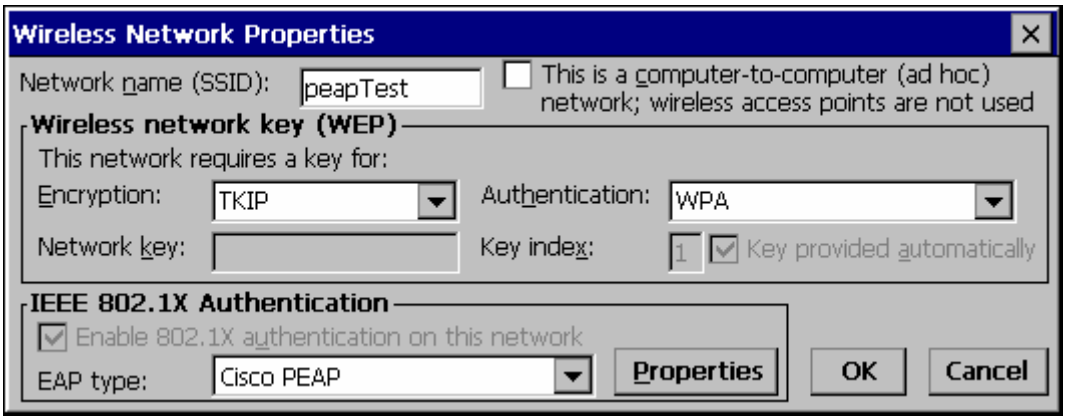


Figure 5-25 Cisco PEAP installed.

If the Cisco installation is correct continue, with the configuration. If it is not correct, follow the procedures below.

Note: Instructions are also included in the README file located in the \SYSTEM folder.

There are two Cisco CAB files in the \SYSTEM folder of the VX7. The default files are:

- CISCO.CAB
- CISCOPEAP.CAB

The default CISCO.CAB file provides for all authentications except Cisco PEAP. When the default CISCO.CAB file is loaded, the Wireless Network Properties screen looks like the figure labeled "No Cisco PEAP", above.

If Cisco PEAP is desired:

1. Rename the CISCO.CAB file to CISCOMSCHAP.CAB.
2. Rename the CISCOPEAP.CAB file to CISCO.CAB.
3. Coldboot the terminal to install the new driver with the registry.

The renamed CISCO.CAB file provides for Cisco PEAP and PEAP/GTC authentications. When the renamed CISCO.CAB file is loaded, the Wireless Network Properties screen looks like the figure labeled “Cisco PEAP Installed”, above.

If it becomes necessary to switch to a different authentication than Cisco PEAP or PEAP/GTC,

1. Rename the CISCO.CAB file to CISCOPEAP.CAB.
2. Rename the CISCOMSCHAP.CAB file to CISCO.CAB
3. Coldboot the terminal to install the new driver with the registry.

Wireless Network Configuration

Use the following instructions for all authentication protocols to configure the Microsoft Wireless Network configuration utility unless WPA/LEAP is used. WPA/LEAP is configured with the Cisco ACU (see Section "WPA/LEAP Authentication Configuration").

Click the ACU icon on the desktop.

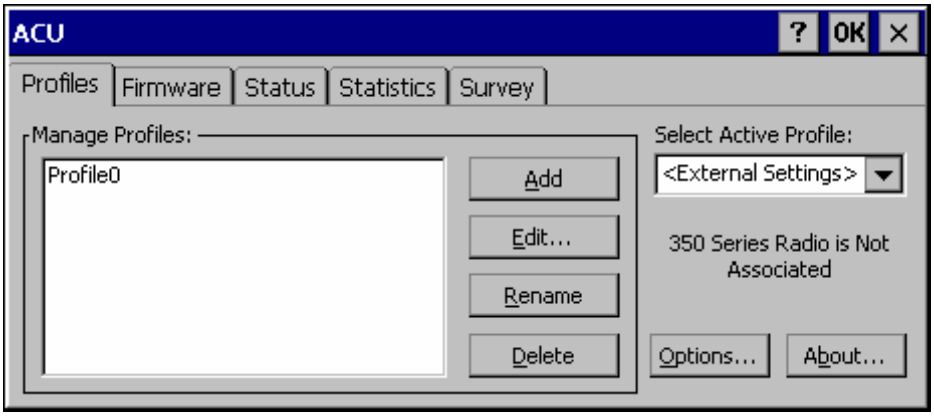


Figure 5-26 Cisco ACU Profile Selection

From the "Select Active Profile" pull down list, select <External Settings>.

Click OK and warmboot.

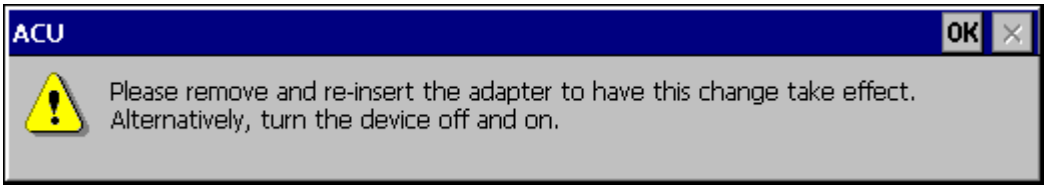


Figure 5-27 Cisco ACU Reboot Message

After booting up, the Microsoft Zero Config tool should start. If it does not, start configuring the wireless connection by clicking on the icon on the task bar shown in below.

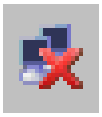


Figure 5-28 Microsoft Wireless Connection Icon

The Wireless Network Connection screen appears.

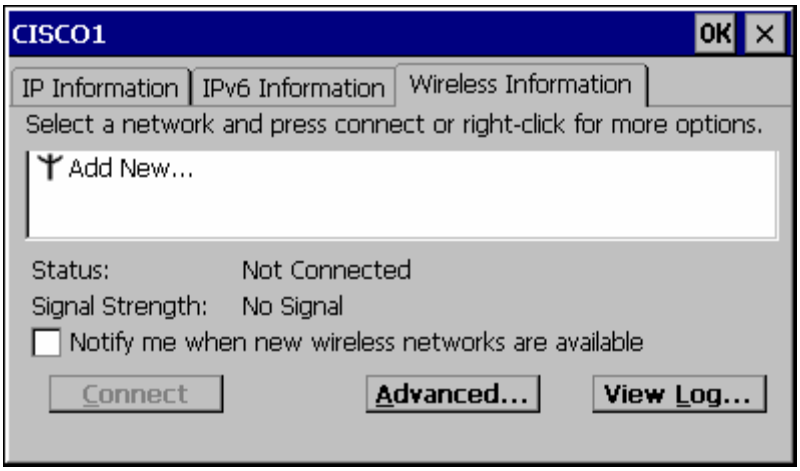


Figure 5-29 Wireless Information Screen

Make sure the “Notify me when new wireless networks are available” box is not checked..

Click the Advanced… button.

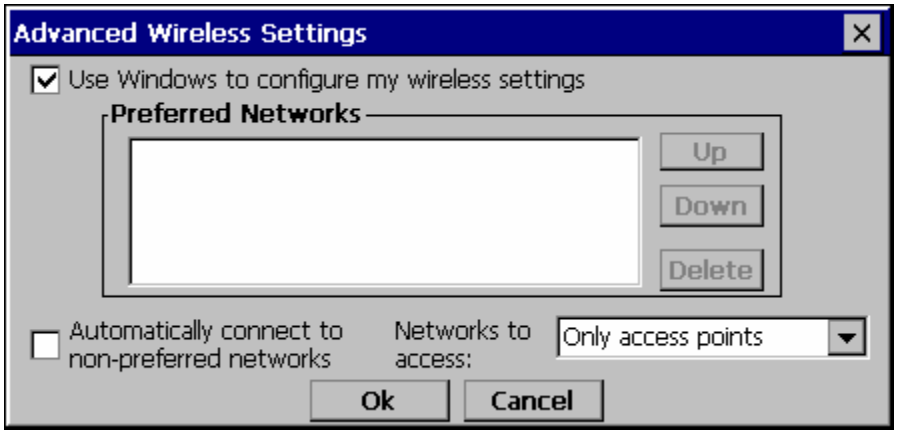


Figure 5-30 Advanced Wireless Settings

Make sure the “Use Windows to configure my wireless settings” box is checked.

Set the “Networks to access” drop down box to “Only access points”.

Click the OK button to return to the Wireless Information Screen.

Click the Add New … line.

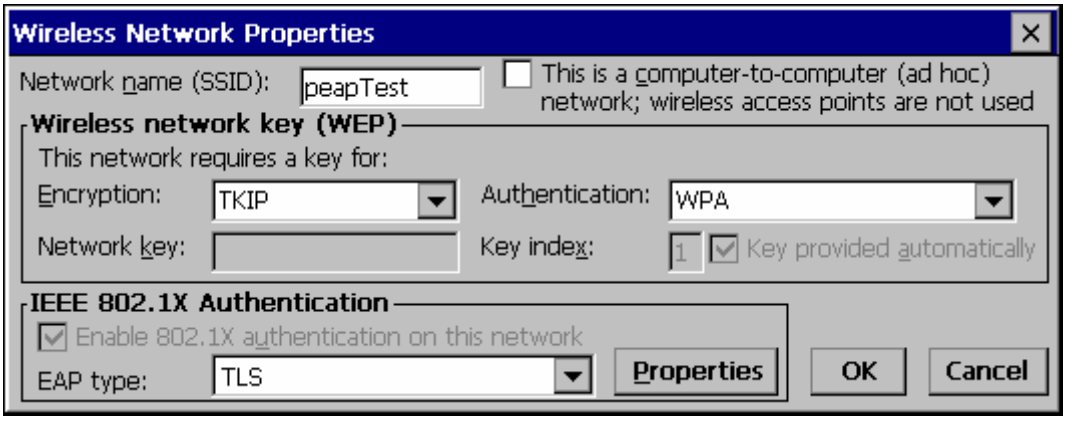


Figure 5-31 Wireless Network Properties

Enter the Network name (SSID) into the text field.

For PEAP/MSCHAP and EAP/TLS, set Encryption to TKIP and Authentication to WPA.

For WPA/PSK see “WPA/PSK Authentication Configuration”.

To configure the IEEE 802.1X Authentication box see the following sections for configuration of each authentication protocol.

PEAP/MS-CHAP Authentication Configuration

The Microsoft supplicant authenticates a user with the PEAP/MS-CHAP protocol. The Cisco CAB file without Cisco PEAP must be used with PEAP/MS-CHAP. See "Installing Radio Drivers", earlier in this chapter, for more information.

Configuring the PEAP/MS-CHAP Supplicant

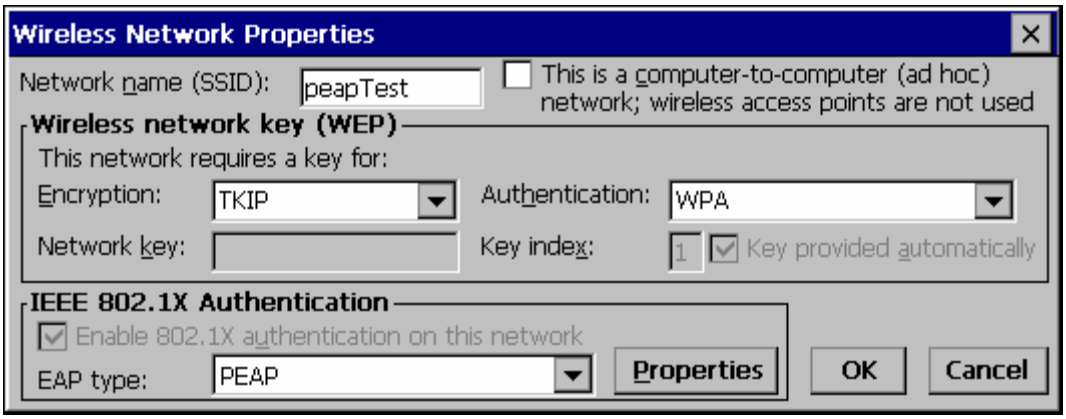


Figure 5-32 PEAP/MSCHAP Wireless Network Properties

With the radio parameters configured (see "Wireless Network Configuration", earlier in this chapter) set the EAP type to PEAP as shown above.

If the EAP type box text is not exactly as shown see "Installing Radio Drivers", earlier in this chapter, to change the radio cab file.

Click the Properties button.

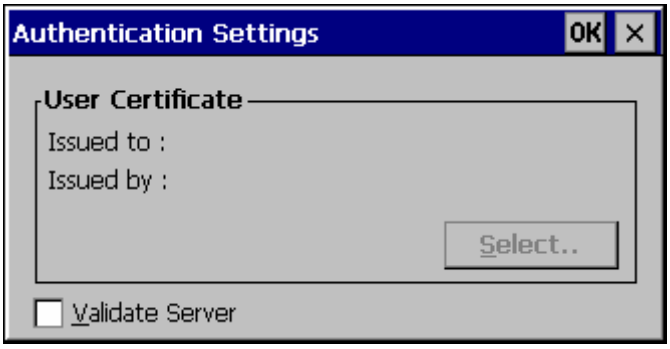


Figure 5-33 Authentication Settings

When first configuring and authenticating, do not validate the server certificate. This allows the user authentication to be tested. When that works, come back to this screen and validate the server certificate.

The login screen appears for logging into the wireless network.

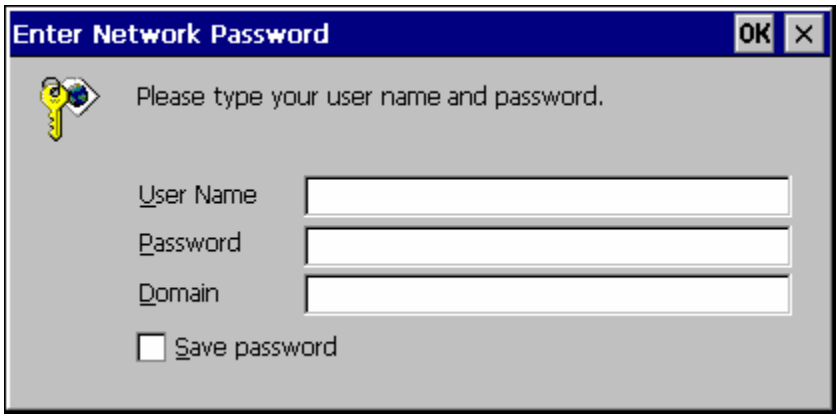


Figure 5-34 Wireless Network Login

Once authenticated, click the IP Information tab.

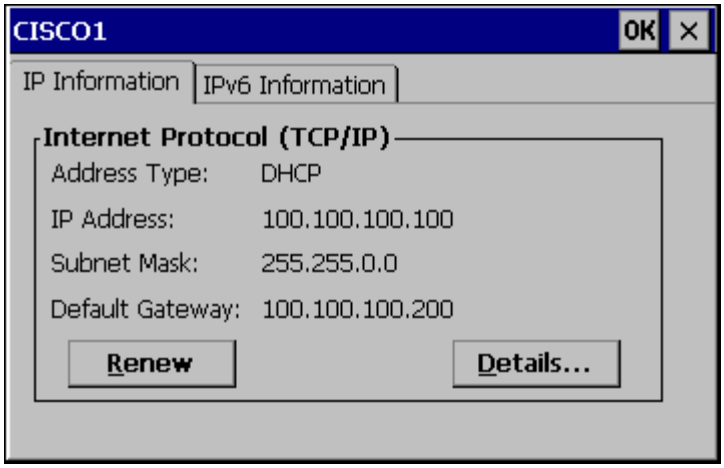


Figure 5-35 IP Information Tab

If the network is set to use DHCP, the VX7 displays the IP address given by the DHCP server.

Now go back and authenticate the server.

Server Authentication

To validate the server certificate install the root CA certificate. For instructions for installing, see "Root Certificates", later in this chapter.

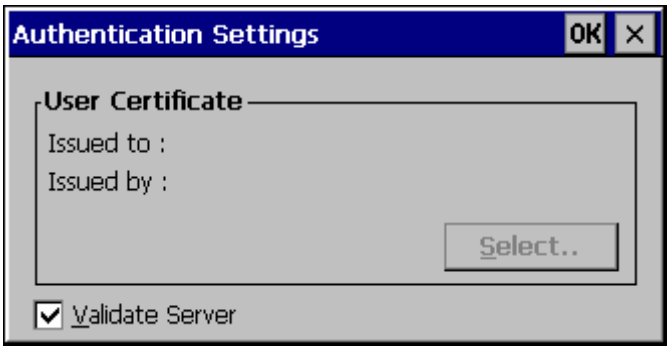


Figure 5-36 Authentication Settings, Validate Server

Navigate to the Wireless Network Properties configuration screen.

Click the Properties button.

Check the Validate server

Click OK to dismiss the configuration boxes.

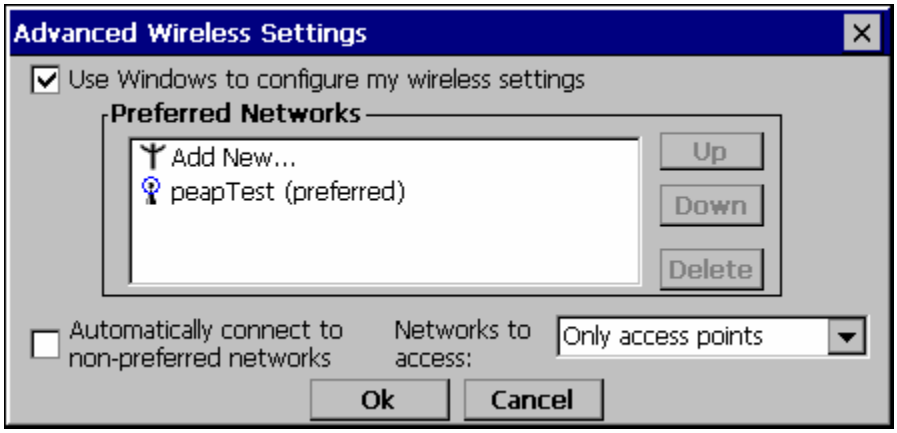


Figure 5-37 Advanced Wireless Settings, Authenticated SSID

Once the authentication completes, the status changes to show the VX7 has authenticated to the <SSID>, as shown in the figure above.

Click on the IP Information tab and make sure there is a valid IP address as shown in the figure labeled "IP Information Tab", earlier in this chapter.

PEAP/ GTC Authentication Configuration

The Microsoft supplicant authenticates a user with the PEAP/GTC protocol.

Configuring the PEAP / GTC Supplicant

With the radio parameters configured set the EAP type to Cisco PEAP as shown below.

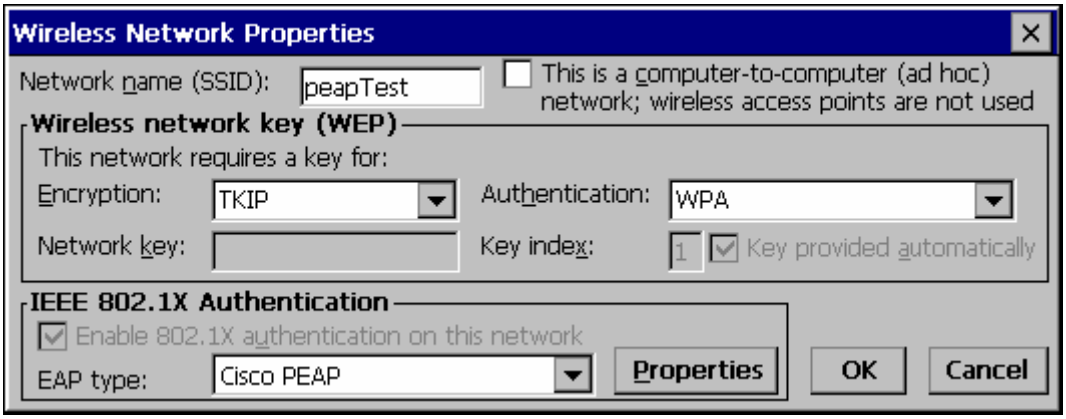


Figure 5-38 PEAP/GTC Wireless Network Properties

If the EAP type box text is not exactly as shown see “Installing Radio Drivers”, earlier in this chapter, to change the radio cab file.

Click the Properties button.

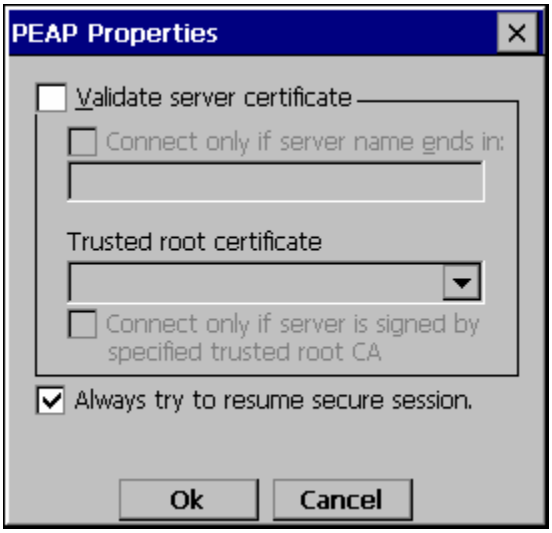

PEAP Properties
Validate server certificate
Connect only if server name ends in:
Trusted root certificate
Connect only if server is signed by specified trusted root CA
Always try to resume secure session.
Ok
Cancel

Figure 5-39 PEAP Properties

When first configuring and authenticating, do not validate the server certificate. This allows the user authentication to be tested. When user authentication is successful, return to this screen and validate the server certificate as shown later in this section.

Check the Always try to resume secure session box.

Note: This box must be checked for the LXE device to roam from one AP to another AP.

Click the OK button.

The login screen appears for logging into the wireless network.

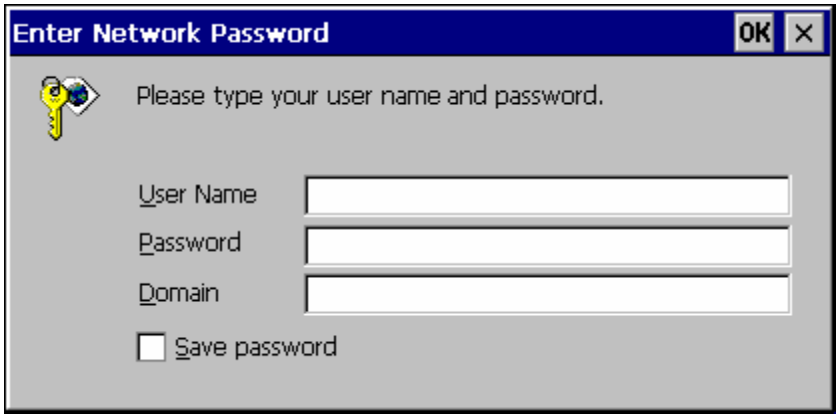


Figure 5-40 Login Screen

Enter valid user credentials.

Once authenticated click the IP Information tab

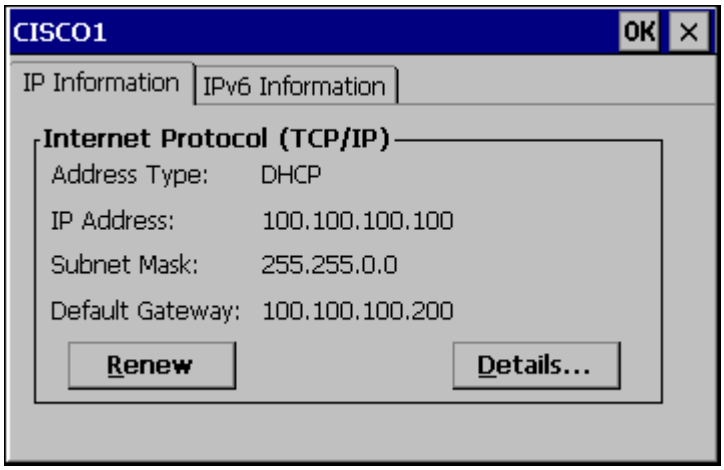


Figure 5-41 IP Information Tab

The .NET device displays the IP address given by the DHCP server.

Now go back and authenticate the server.

Server Authentication

To validate the server certificate, the root CA certificate must be installed. For instructions for installing, see “Installing a Root CA Certificate” in this chapter. The RADIUS server certificate is not required, only the root CA which issued the server certificate.

Navigate to the Wireless Network Properties configuration screen.

Click the Properties button.

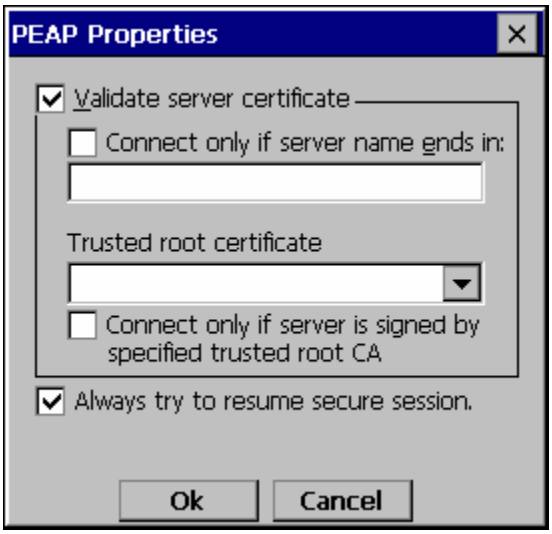

PEAP Properties
Validate server certificate
Connect only if server name ends in:
Trusted root certificate
Connect only if server is signed by specified trusted root CA
Always try to resume secure session.
Ok
Cancel

Figure 5-42 PEAP Properties, Validate Server Certificate

Check the Validate server certificate box.

Click OK to dismiss the configuration boxes.

When the login box appears enter valid user credentials.

It is possible for to be prompted to accept a Root CA certificate when using PEAP/GTC.

If the trusted root certificate box (as shown in the previous figure) is blank the user will be prompted to accept the Root CA certificate by name as shown below.

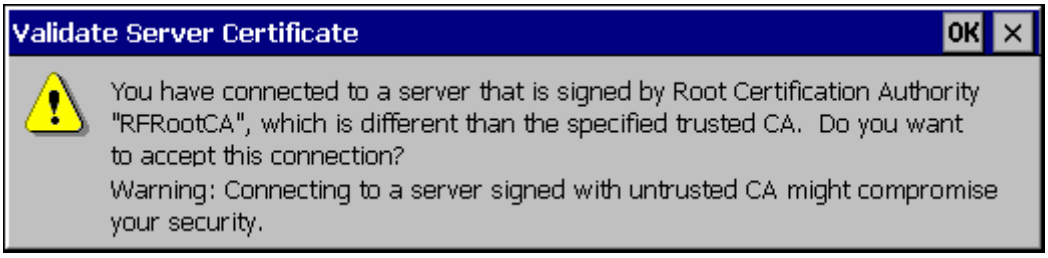

Validate Server Certificate
OK
You have connected to a server that is signed by Root Certification Authority "RFRootCA", which is different than the specified trusted CA. Do you want to accept this connection?
Warning: Connecting to a server signed with untrusted CA might compromise your security.

Figure 5-43 Server Connection Warning

If this is the correct server certificate Root CA, click OK. If not, install the correct Root CA as described in “Installing a Root CA Certificate” in this chapter .

By clicking OK, the Trusted root certificate box is filled in on the properties window.

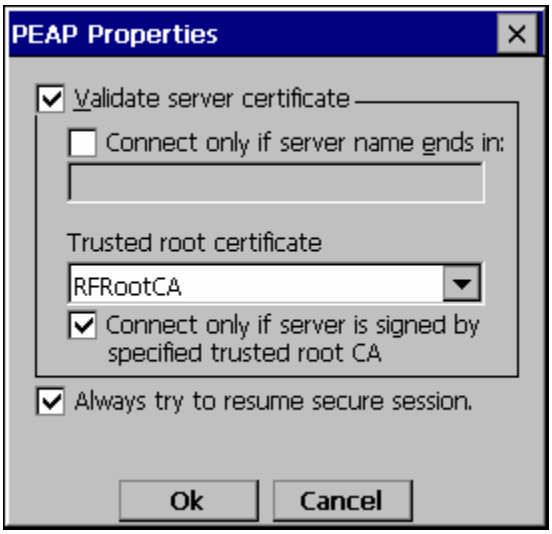


Figure 5-44 PEAP Properties, Trusted Root Certificate

The same thing can be done for the Connect only if server name ends in field. Check the box and leave the field blank. A prompt window will appear asking for confirmation of the correct server name.

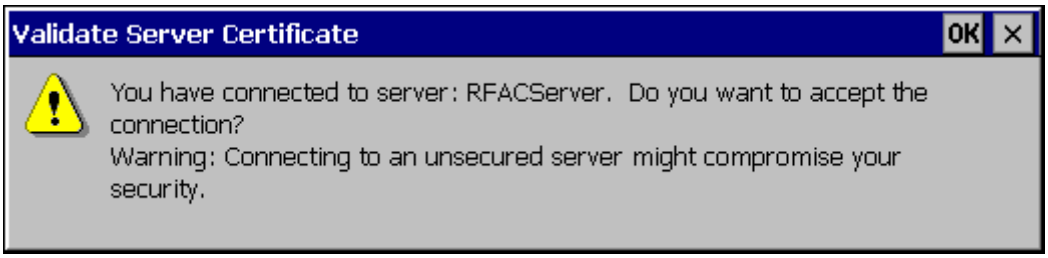

Validate Server Certificate
OK
You have connected to server: RFACServer. Do you want to accept the connection?
Warning: Connecting to an unsecured server might compromise your security.

Figure 5-45 Accept Server Connection Warning

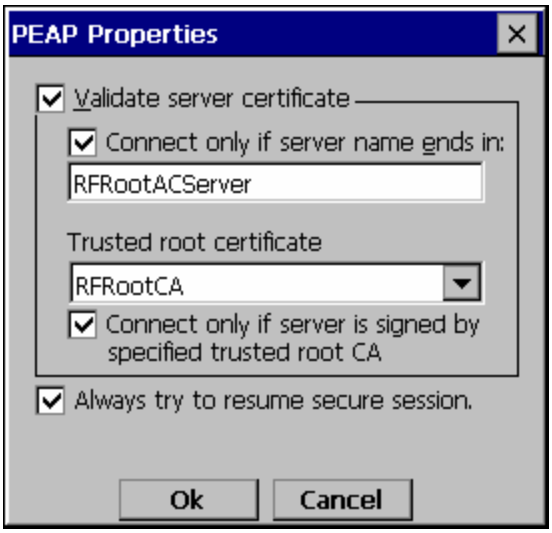


Figure 5-46 PEAP Properties, Connect Only If Server Name Ends In

If the ACS server name is correct, click the OK button and the server name field will be filled in with the correct server name.

The other option is to fill in the correct name

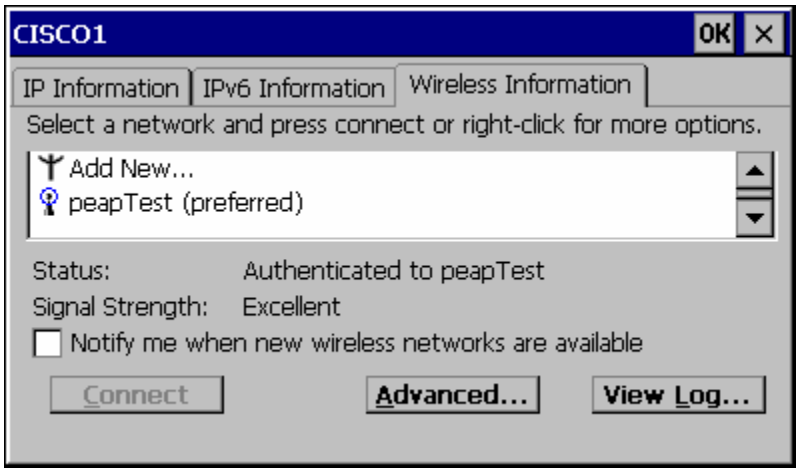


Figure 5-47 Wireless Information, Authenticated

Once the authentication completes the status will change to Authenticated to <SSID> as shown.

Click on the IP Information tab and make sure there is a valid IP address as shown previously in this section.

WPA/LEAP

LEAP is a Cisco proprietary authentication protocol and is not supported by the Microsoft supplicant. To configure the VX7 for WPA/LEAP, use the Cisco ACU installed during normal installation of the Cisco radio driver.

Cisco ACU

Start the Cisco ACU by clicking the icon on the desktop or navigate to **Start | Programs | Cisco | ACU**.

Click on the Profile tab.

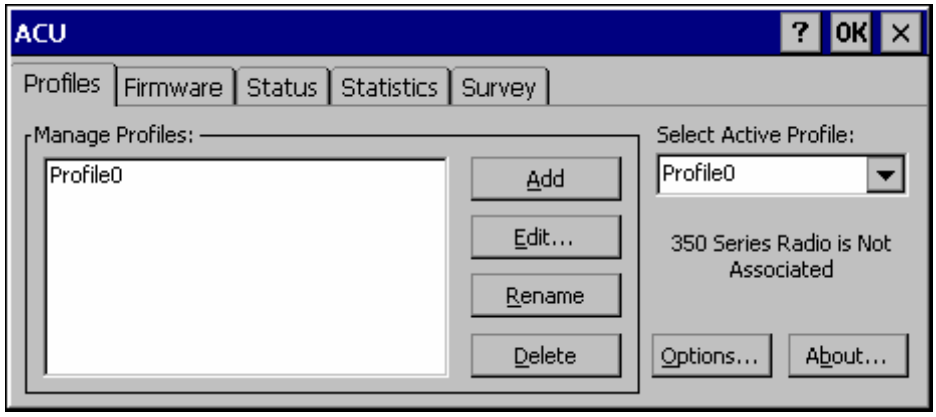


Figure 5-48 ACU Profile Tab

Click the Rename button.

Name the profile

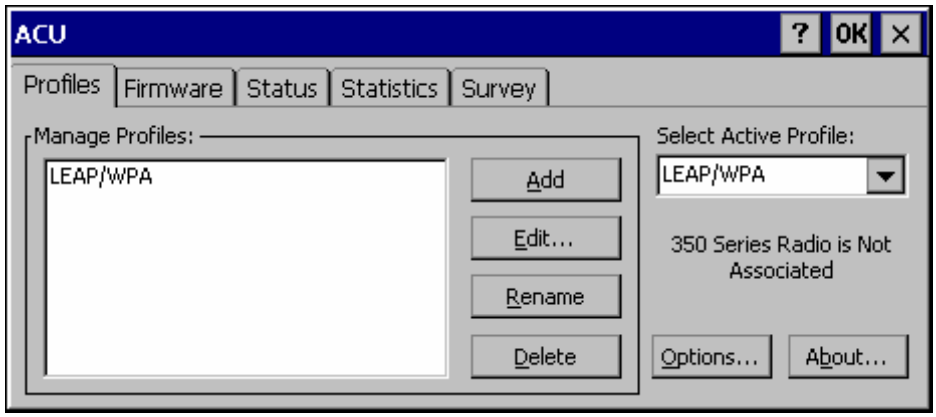


Figure 5-49 Renaming Profile

Click the Edit button.

The profile properties screen is displayed.

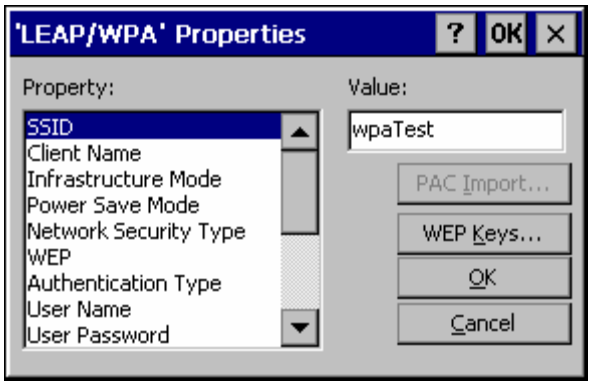


Figure 5-50 Profile Properties Screen

Enter the SSID and Client Name in the correct fields.

Set the Network Security Type to LEAP(WPA).

Click the OK button.

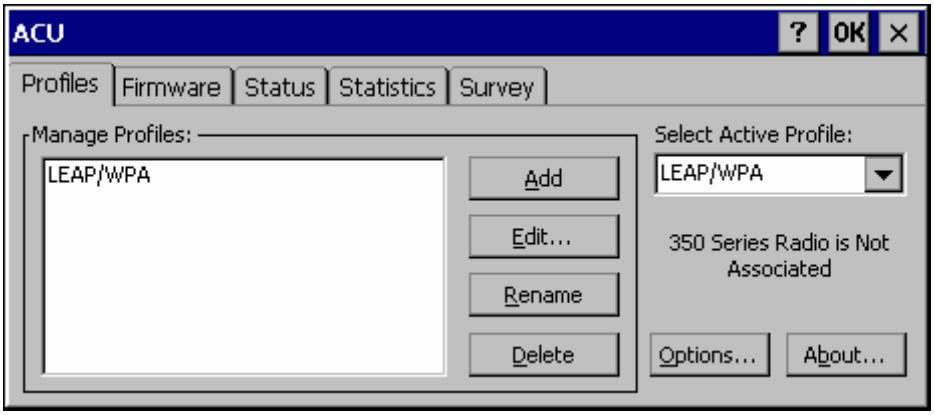


Figure 5-51 Select Profile

Use the drop down box to choose the profile just configured.

Click OK.

The VX7 associates and displays the sign on screen.

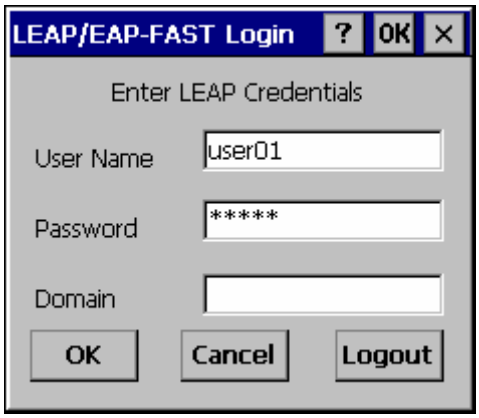


Figure 5-52 Login Screen

Click the Status tab to display status.

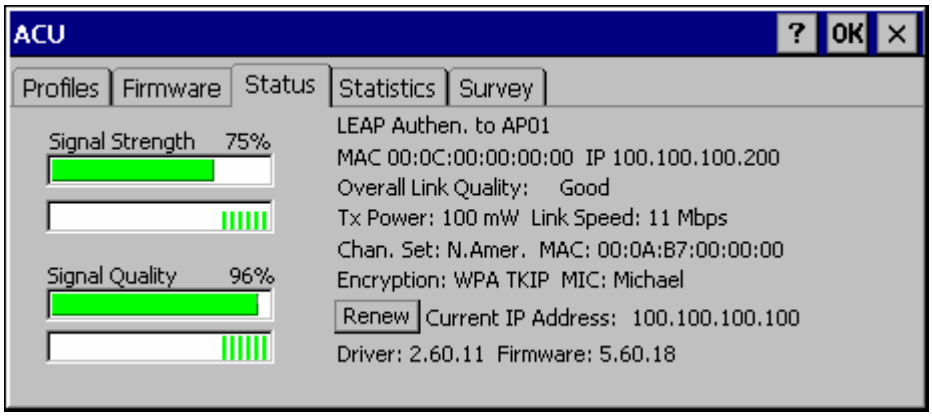


Figure 5-53 ACU Status Tab

EAP-TLS Authentication Configuration

To authenticate using the EAP-TLS protocol you need a user certificate file and a private key file. Once you have the user certificate files run the certificate installer from the Microsoft control panel. For EAP-TLS it does not matter which Cisco cab file is installed.

Note: It is important that all dates are correct on the .NET computers when using any type of certificate. Certificates are date sensitive and if the date is not correct authentication will fail.

User Certificate

To check if a user certificate is installed navigate to **Start | Control Panel | Certificates**.

Set the drop down box to “My Certificates” as shown below.

The correct user certificate should be shown in the right pane.

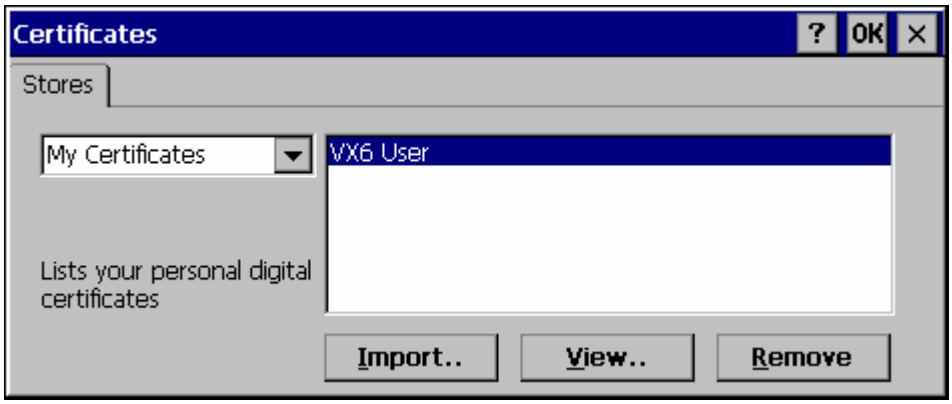


Figure 5-54 Certificate Stores

Click the View button.

Figure 5-55 View Certificate Details

Set the Field to Private Key

Make sure the private key is Present.

If it is not present, install the private key file.

If there is no user certificate refer to “User Certificates”, earlier in this chapter, to acquire a user certificate and private key file.

Setting EAP/TLS Parameters

With the radio parameters configured (see “Wireless Network Configuration”) set the EAP type to TLS as shown.

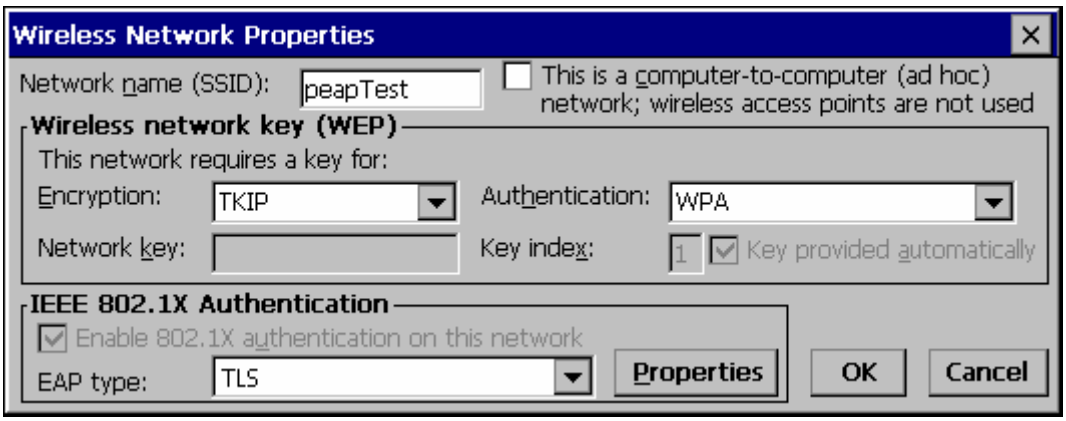


Figure 5-56 EAP/TLS Configuration

Click the Properties button.

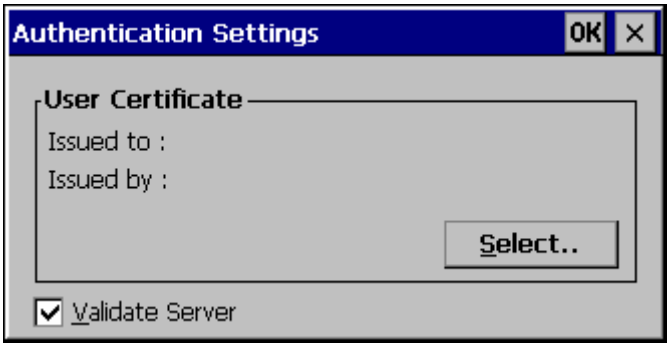


Figure 5-57 Authentication Settings

Click the Select button to choose the user certificate.

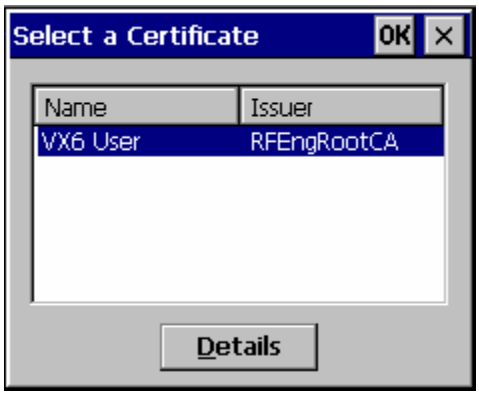


Figure 5-58 Select Certificate

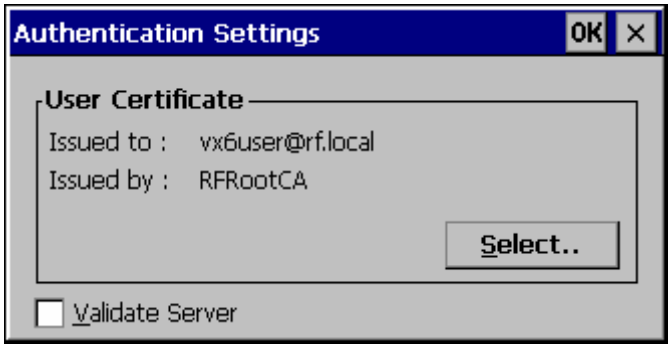


Figure 5-59 Authentication Settings, Certificate Details

Do not check the Validate server certificate box. This allows the user to be authenticated as the first step.

When the user certificate successfully authenticates, come back to this screen and validate the server certificate as described in the next section.

Click the OK button to dismiss the configuration screens.

When the radio re-connects the user is authenticated with the user certificate.

If the user does not authenticate, recheck the user certificate and the date on the computer.

Validating the Server Certificate

Before validating the server certificate, make sure the Root CA certificate is installed on the VX7.

Navigate to the Wireless Network Properties configuration screen.

Click the Properties button.

Check the Validate server box as shown below.

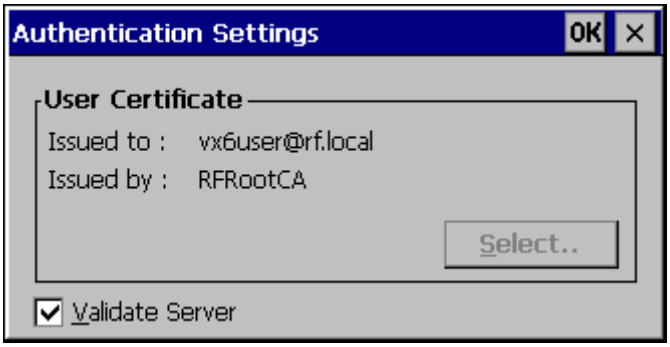


Figure 5-60 Validate Server

Click OK to dismiss the configuration boxes.

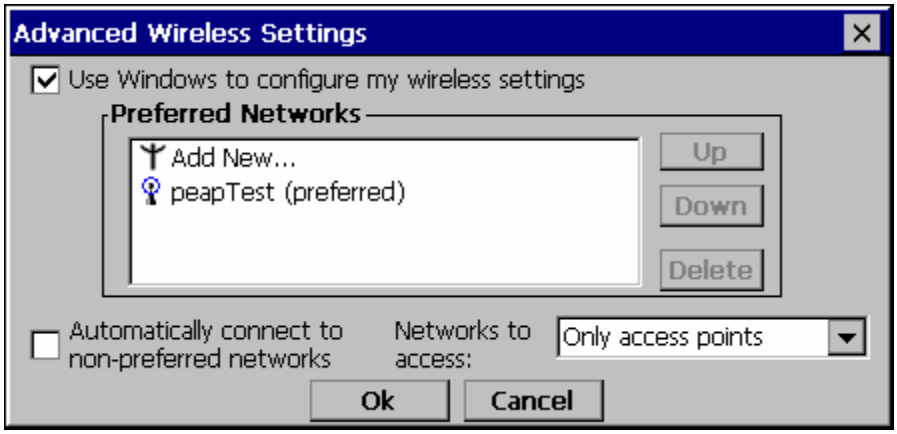


Figure 5-61 SSID Authenticated

Once the authentication completes the status changes to show the VX7 has authenticated to <SSID> as shown above.

WPA PSK Configuration

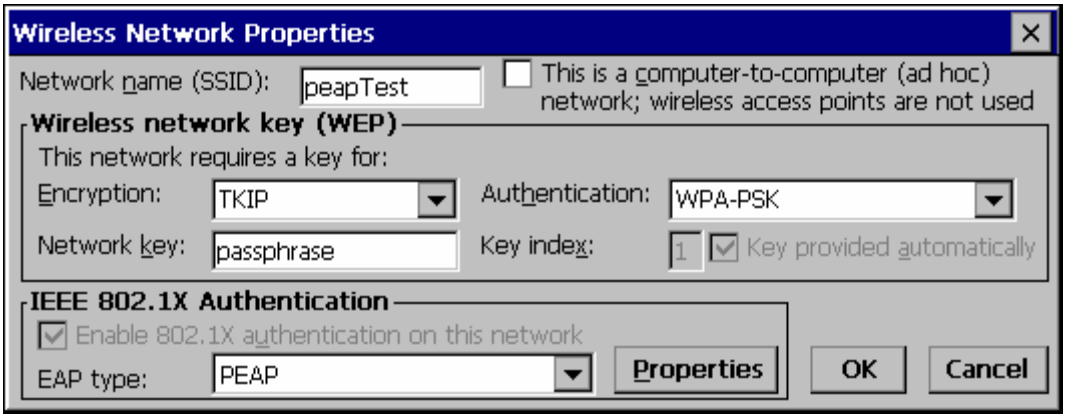


Figure 5-62 WPA PSK Configuration

Configure the Wireless Network Settings as described in “Wireless Network Settings”, earlier in this chapter.

Change the Network Authentication to WPA-PSK.

Enter an ASCII network key in the text field. Hex keys do not work in the Microsoft Zero Config utility at this time.

There is no server authentication when using WPA-PSK.

Click the OK button to complete configuration.

Symbol Radio

The Symbol radio is a 2.4GHz 802.11b radio. This radio supports no encryption and WEP.

Note: When making changes to profile parameters, the VX7 should be warmbooted afterwards.

Access: Double Tap the Network Connected Icon in the Status Bar

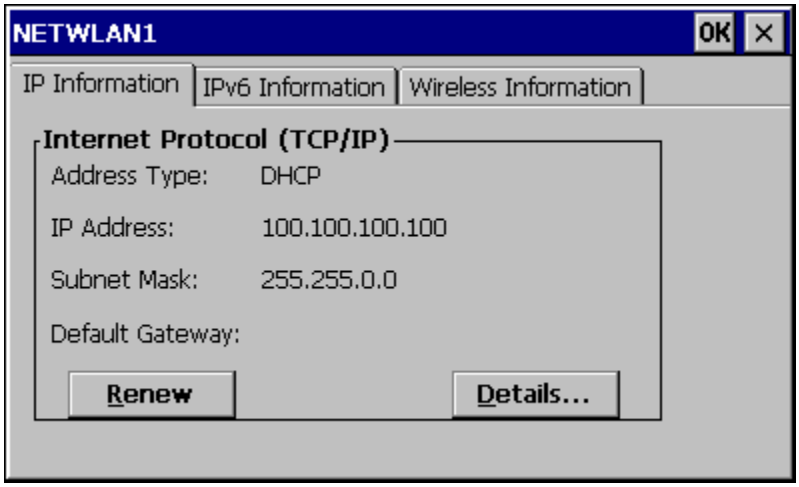


Figure 5-63 Symbol NETWLAN Screen

IP Information Tab

After the IP Address has been assigned to the VX7, tap the Renew button to renew the IP address if necessary.

Tap the Details button to view the Network Connection details.

IPv6 Information Tab

This is the TCP/IPv6 information screen. The contents cannot be edited by the user.

Note: IPv6 can be disabled. Please see "Configuring IPv6 Broadcast Messages", earlier in this chapter.

Wireless Information Tab

Factory Default Settings	
Wireless Information tab	
Notify when new networks available	Enabled
Advanced Button	
Use Windows to configure wireless settings	Enabled
Automatically connect to non-preferred networks	Disabled
Networks to access (Only APs, Only comp-to-comp)	All available
Encryption (WEP, TKIP)	WEP
Authentication (WPA, Open, Shared, WPA-PSK)	WPA
Ad hoc network	Disabled
Key provided automatically	Enabled
Enable 802.1X authentication	Enabled
EAP Type (MDF-Challenge, PEAP, TLS)	TLS

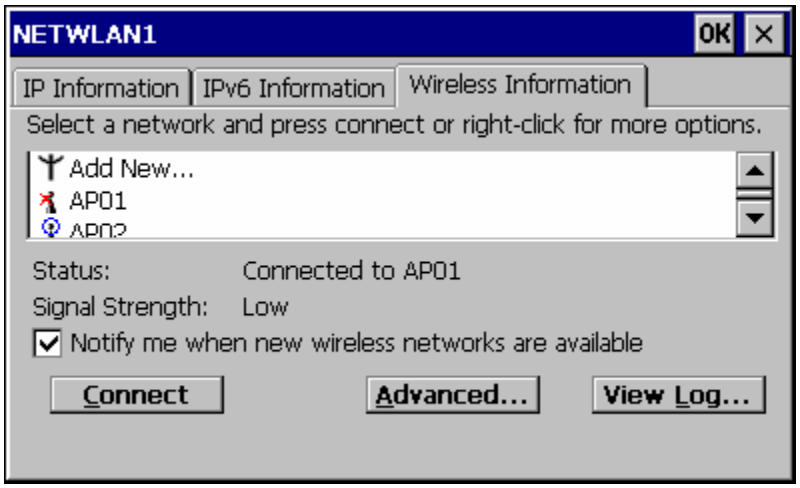


Figure 5-64 Symbol Wireless Information Tab

View Log

Displays the logon/connection data for the current network connection.

Add a new connection

Select **Add New**. Enter the SSID in the **Network Name** text box.

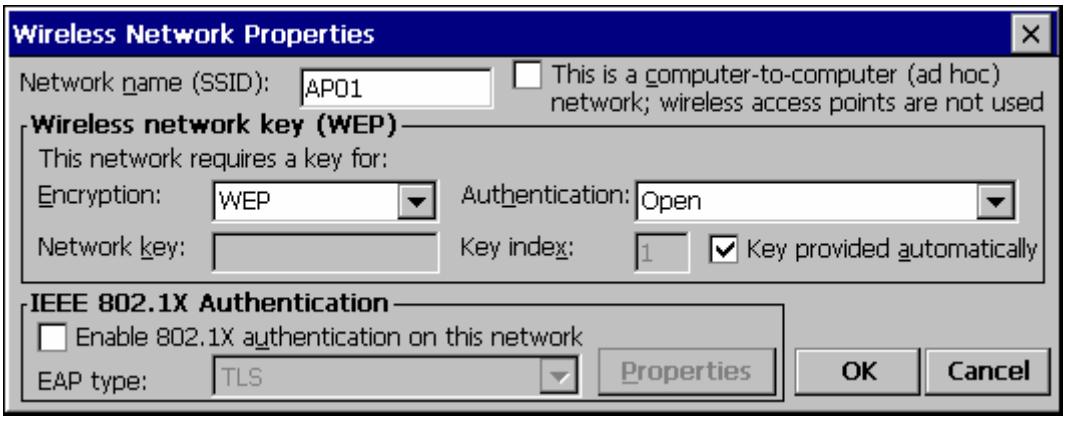


Figure 5-65 Symbol Wireless Network Properties

Disable WEP

- If WEP is to be disabled, tap the down arrow in the **Authentication** drop down box. Select **Open**.
- Tap the down arrow in the **Encryption** drop down box. Tap **Disabled** and WEP is disabled.
- Tap the **OK** button to return to the **Wireless Information** tab.

Enable WEP

- Tap the down arrow in the **Authentication** drop down box.
- Tap the **WEP Authentication** protocol.
- If the key is provided automatically by your network, check the "**Key provided automatically**" checkbox.
- If you wish to enter your Authentication key, uncheck the "**Key provided automatically**" checkbox and enter the Network Key in the **Network Key** text box.
- Tap the **OK** button to return to the **Wireless Information** tab.

Continue

Tap the **Advanced** … button on the Wireless Information Tab. Make sure there is a checkmark in the "**Use Windows to configure my wireless settings**" checkbox. Make sure there is ***no*** checkmark in the "**Automatically connect to non-preferred networks**" checkbox.

Tap **OK** to return to the **Wireless Information** tab.

Tap the **Connect** button.

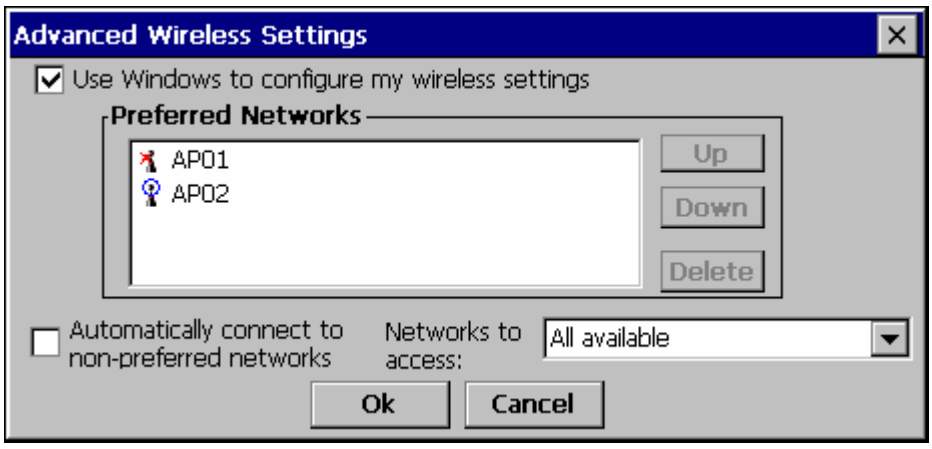


Figure 5-66 Symbol Advanced Wireless Settings

To access NETWLAN1 Properties again, double tap the **Network Connected icon** in the Toolbar.

Select a User Certificate

1. Select Wireless Information Tab
2. Select a network by double tapping the network name.
3. In the IEEE 802.1X Authentication box, enable 802.1X authentication
4. Select an EAP type
5. Tap the Properties button. Validate Server is enabled by default.
6. At the Authentication Settings display, tap the Select button to choose a User Certificate.

Certificates

Root Certificates

Generating a Root CA Certificate

	Please refer to the “LXE Security Primer” for more information on obtaining and installing root certificates.

The easiest way to get the root CA certificate is to use a browser on a PC to navigate to the CA. To request the root CA certificate, open a browser to

http://<CA IP address>/certsrv.

Sign into the CA with any valid username and password.

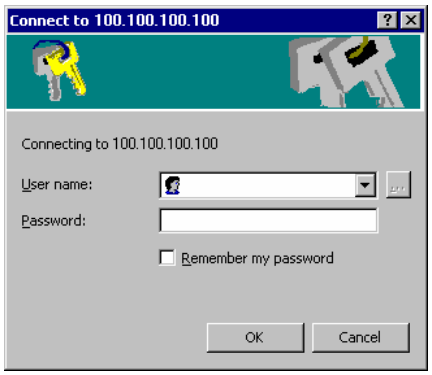


Figure 5-67 Logon to Certificate Authority

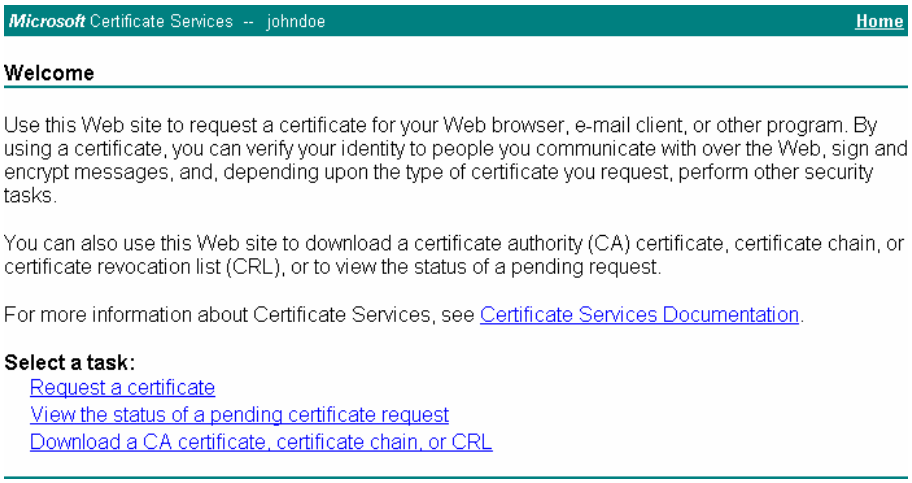

Microsoft Certificate Services -- johndoe
Home
Welcome
Use this Web site to request a certificate for your Web browser, e-mail client, or other program. By using a certificate, you can verify your identity to people you communicate with over the Web, sign and encrypt messages, and, depending upon the type of certificate you request, perform other security tasks.
You can also use this Web site to download a certificate authority (CA) certificate, certificate chain, or certificate revocation list (CRL), or to view the status of a pending request.
For more information about Certificate Services, see Certificate Services Documentation.
Select a task:
Request a certificate
View the status of a pending certificate request
Download a CA certificate, certificate chain, or CRL

Figure 5-68 Certificate Services Welcome Screen

Click the **Download a CA certificate, certificate chain or CRL** link.

Make sure the correct root CA certificate is selected in the list box.

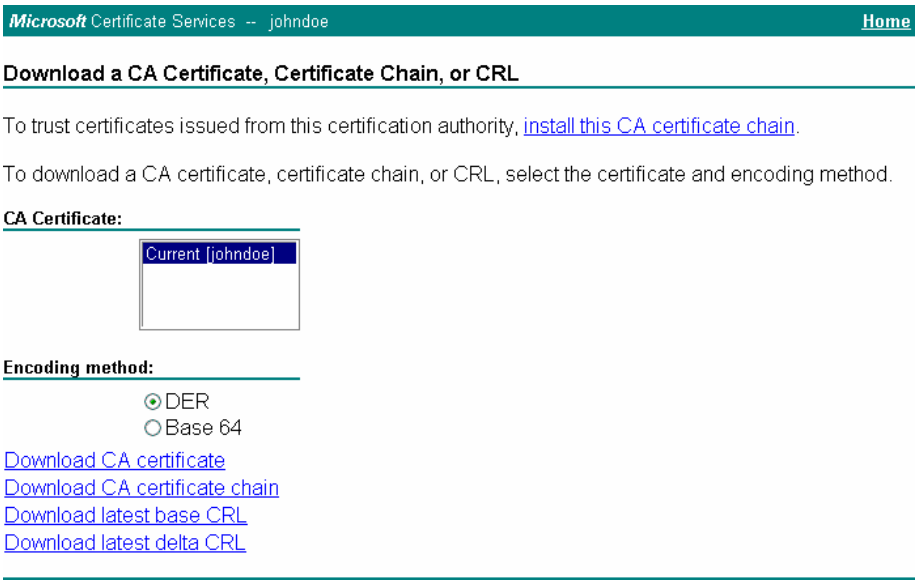

Microsoft Certificate Services -- johndoe
Home
Download a CA Certificate, Certificate Chain, or CRL
To trust certificates issued from this certification authority, install this CA certificate chain.
To download a CA certificate, certificate chain, or CRL, select the certificate and encoding method.
CA Certificate:
Current [johndoe]
Encoding method:
DER
Base 64
Download CA certificate
Download CA certificate chain
Download latest base CRL
Download latest delta CRL

Figure 5-69 Download CA Certificate Screen

Click the DER button.

To download the CA certificate, click on the **Download CA certificate** link.

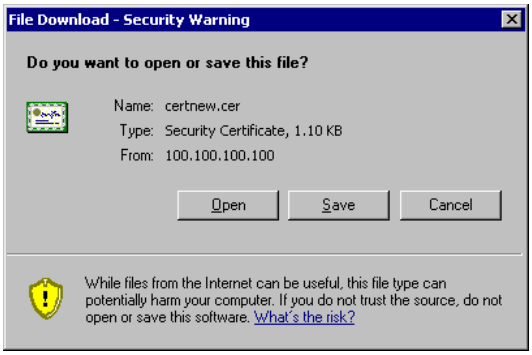

File Download - Security Warning
Do you want to open or save this file?
Name: certnew.cer
Type: Security Certificate, 1.10 KB
From: 100.100.100.100
Open
Save
Cancel
While files from the Internet can be useful, this file type can potentially harm your computer. If you do not trust the source, do not open or save this software. What's the risk?

Figure 5-70 Download CA Certificate Screen

Click the Save button and save the certificate. Make sure to keep track of the name and location of the certificate.

Installing a Root CA Certificate

Note: This section is used for Cisco radios only. Summit radios do not use the Windows certificate store. Instead, copy the certificate to the \System folder for use with a Summit radio.

Copy the certificate file to the VX7. Import the certificate by navigating to **Start | Control Panel | Certificates**.

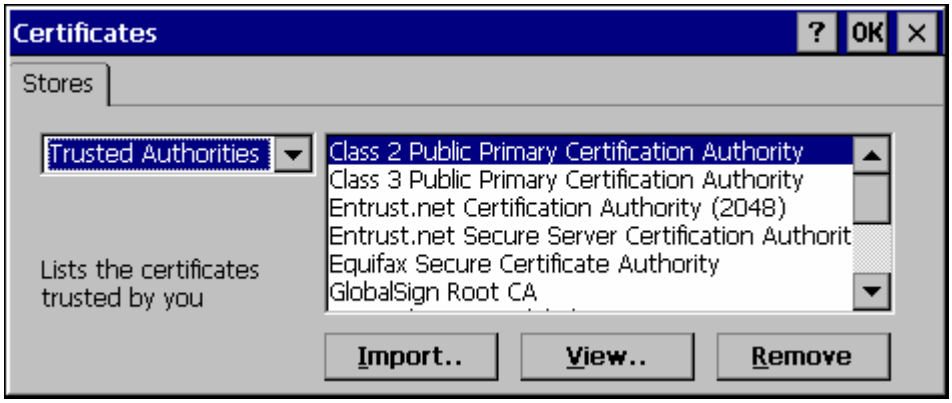


Figure 5-71 Certificates

Click the "Import" button.

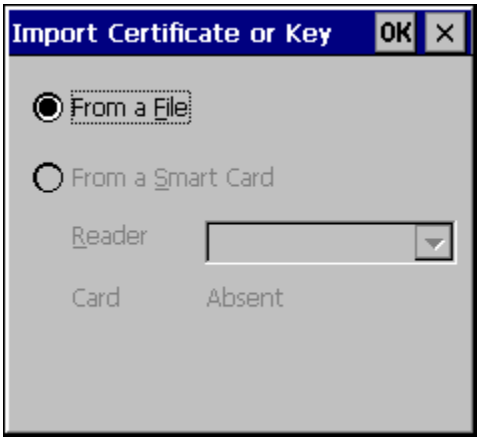


Figure 5-72 Import Certificate

Make sure "From a File" is selected and click OK.

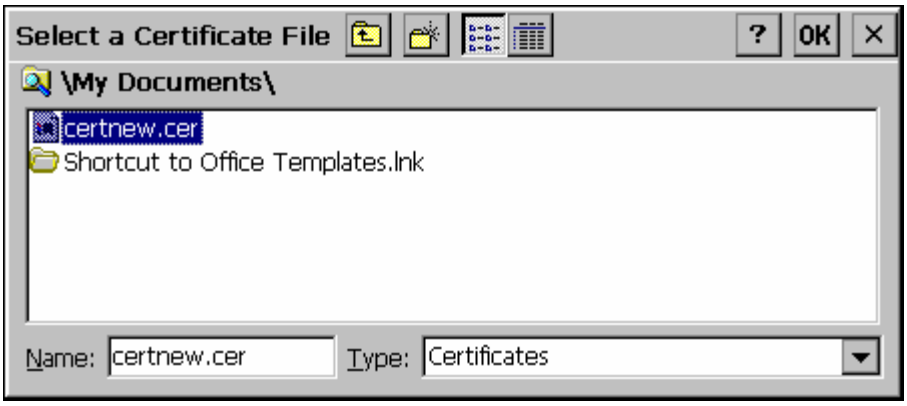


Figure 5-73 Browsing to Certificate Location

Using the explorer buttons, browse to the location where you copied the certificate, select the certificate desired and click OK.

Root Certificate Store
Do you want to ADD the following certificate to the Root Store?
Subject : doe, SUPPORT, LOCAL
Issuer : Self Issued
Time Validity : Thursday, July 01, 2004 through Tuesday, July 01, 2014
Serial Number : 12345678 90ABCDEF 12345678 90ABCDEF
Yes
No

Figure 5-74 Certificate Import Confirmation

Click Yes to import the certificate.

Once the certificate is installed, return to the proper authentication section, earlier in this manual.

User Certificates

User certificates are only needed for EAP-TLS.

Generating a User Certificate

	Please refer to the "LXE Security Primer" for more information on obtaining and installing user certificates.

The easiest way to get the user certificate is to use a browser on a PC to navigate to the CA. To request the user certificate, open a browser to

http://<CA IP address>/certsrv.

Sign into the CA with the username and password of the person who will be logging into the mobile device.

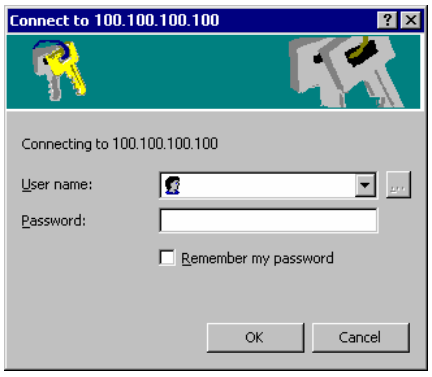


Figure 5-75 Logon to Certificate Authority

This process saves a user certificate and a separate private key file. CE .NET devices such as the VX7 require the private key to be saved as a separate file rather than including the private key in the user certificate.

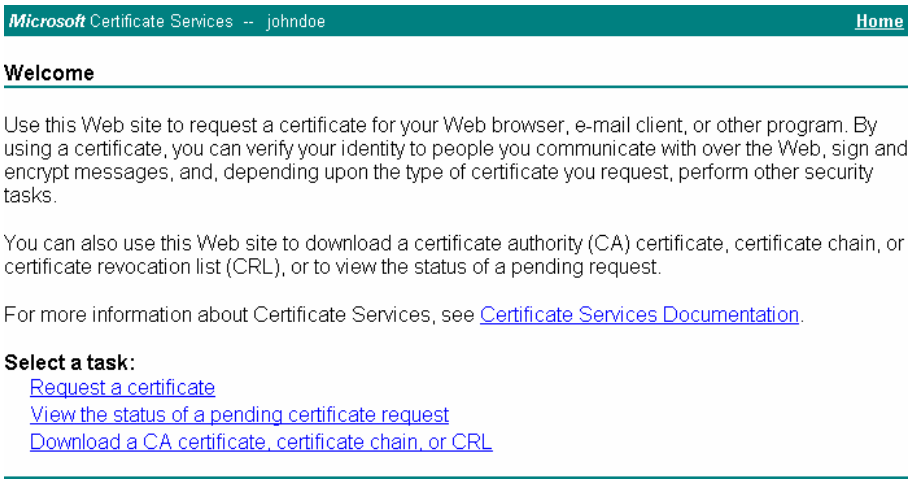

Microsoft Certificate Services -- johndoe
Home
Welcome
Use this Web site to request a certificate for your Web browser, e-mail client, or other program. By using a certificate, you can verify your identity to people you communicate with over the Web, sign and encrypt messages, and, depending upon the type of certificate you request, perform other security tasks.
You can also use this Web site to download a certificate authority (CA) certificate, certificate chain, or certificate revocation list (CRL), or to view the status of a pending request.
For more information about Certificate Services, see Certificate Services Documentation.
Select a task:
Request a certificate
View the status of a pending certificate request
Download a CA certificate, certificate chain, or CRL

Figure 5-76 Certificate Services Welcome Screen

Click the **Request a certificate** link.

Figure 5-77 Request a Certificate Screen

Click on the **advanced certificate request** link.

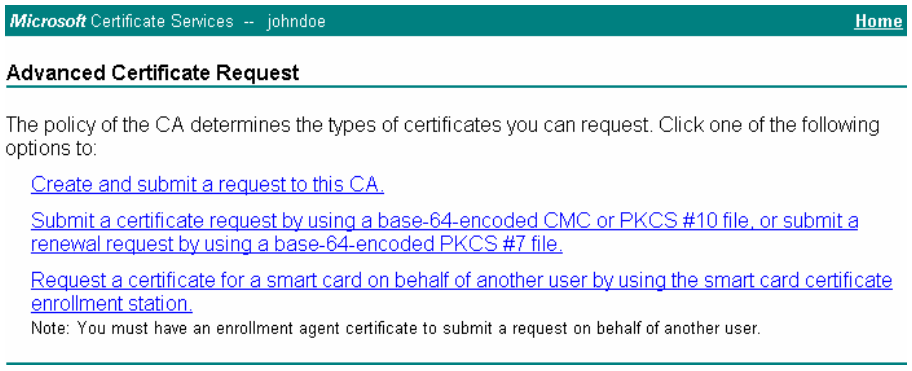

Microsoft Certificate Services -- johndoe
Home
Advanced Certificate Request
The policy of the CA determines the types of certificates you can request. Click one of the following options to:
Create and submit a request to this CA.
Submit a certificate request by using a base-64-encoded CMC or PKCS #10 file, or submit a renewal request by using a base-64-encoded PKCS #7 file.
Request a certificate for a smart card on behalf of another user by using the smart card certificate enrollment station.
Note: You must have an enrollment agent certificate to submit a request on behalf of another user.

Figure 5-78 Advanced Certificate Request Screen

Click on the **Create and submit a request to this CA** link.

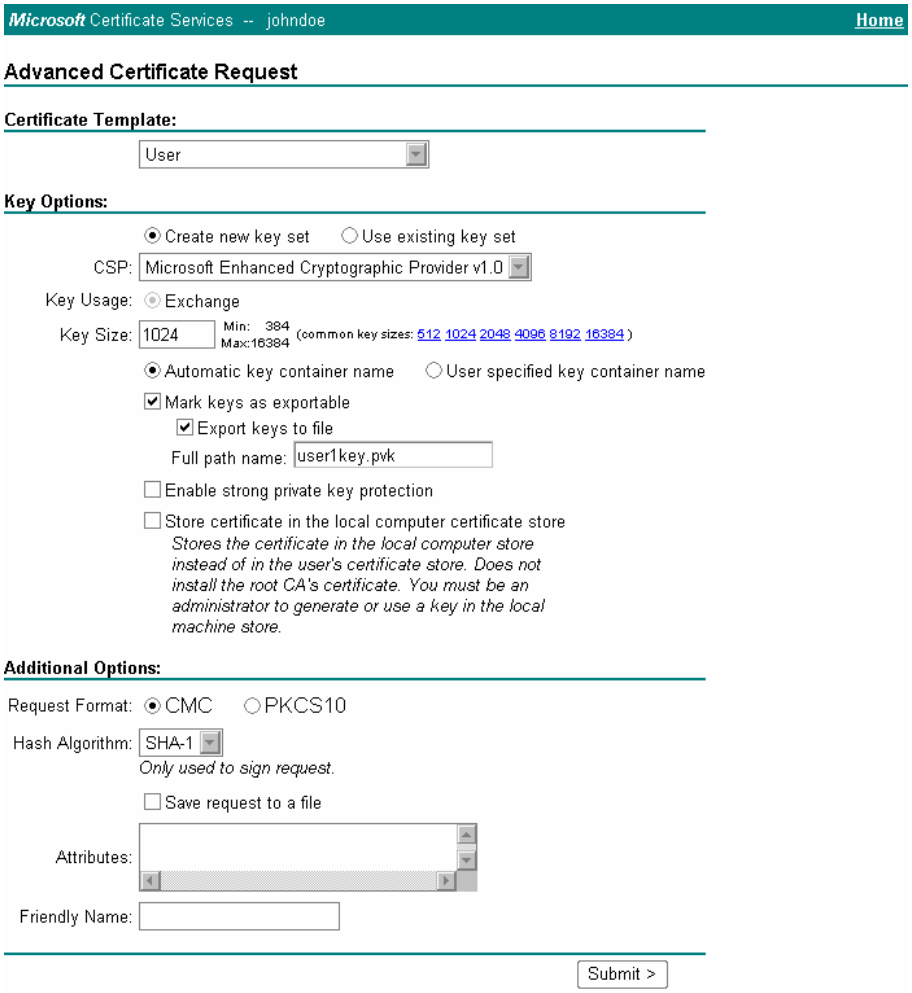


Figure 5-79 Advanced Certificate Details

For the Certificate Template, select “User”.

Check the “Mark keys as exportable” and the “Export keys to file” checkboxes.

Type the full path on the local PC where the private key is to be copied. Also specify the private key filename.

⚠	Be sure to note the name used for the private key file, for example VX7USER.PVK. The certificate file created later in this process must be given the same name, for example, VX7USER.CER.

DO NOT check to use strong private key protection.

Make any other desired changes and click the “Submit” button.

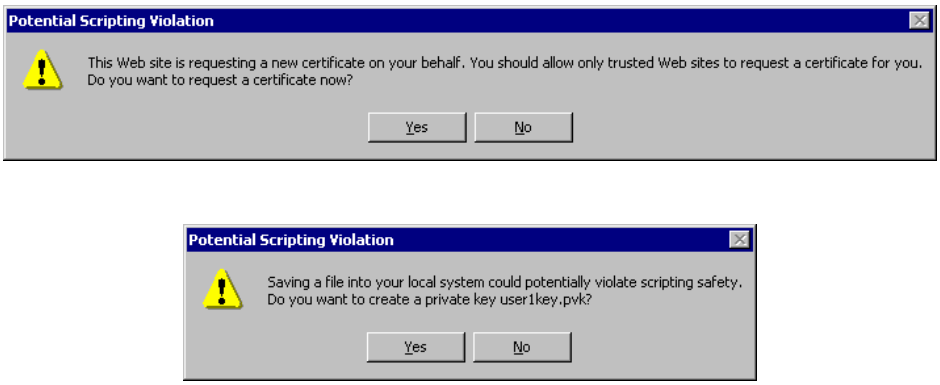

Potential Scripting Violation
This Web site is requesting a new certificate on your behalf. You should allow only trusted Web sites to request a certificate for you.
Do you want to request a certificate now?
Yes
No
Potential Scripting Violation
Saving a file into your local system could potentially violate scripting safety.
Do you want to create a private key user1key.pvk?
Yes
No

Figure 5-80 Script Warnings

If any script notifications occur, click the "Yes" button to continue the certificate request.

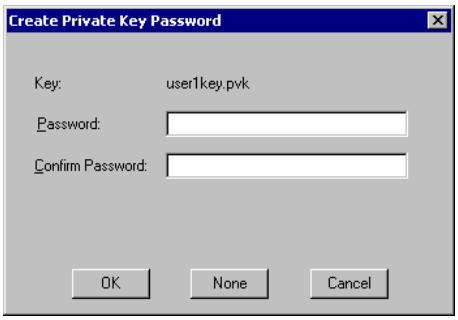


Figure 5-81 Script Warnings

When prompted for the private key password:

- Click "None" if you do not wish to use a password, *or*
- Enter and confirm your desired password then click "OK".

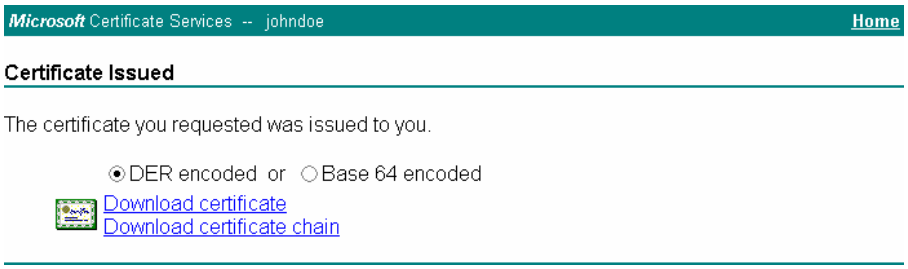


Figure 5-82 Certificate Issued

Click the **Download certificate** link.

File Download
Some files can harm your computer. If the file information below looks suspicious, or you do not fully trust the source, do not open or save this file.
File name: certnew.cer
File type: Security Certificate
From: 100.100.100.100
This type of file could harm your computer if it contains malicious code.
Would you like to open the file or save it to your computer?
Open
Save
Cancel
More Info
Always ask before opening this type of file

Figure 5-83 Download Security Warning

Click Save to download and store the user certificate to the PC. Make sure to keep track of the name and location of the certificate. The private key file is also downloaded and saved during this process.

⚠	Be sure use the same name for the certificate file as was used for the private key file. For example, it the private key was saved as VX7USER.PVK then the certificate file created must be given the same name, for example, VX7USER.CER.

Installing a User Certificate

Copy the certificate and private key files to the VX7. Import the certificate by navigating to **Start | Control Panel | Certificates**.

Select “My Certificates” from the pull down list.

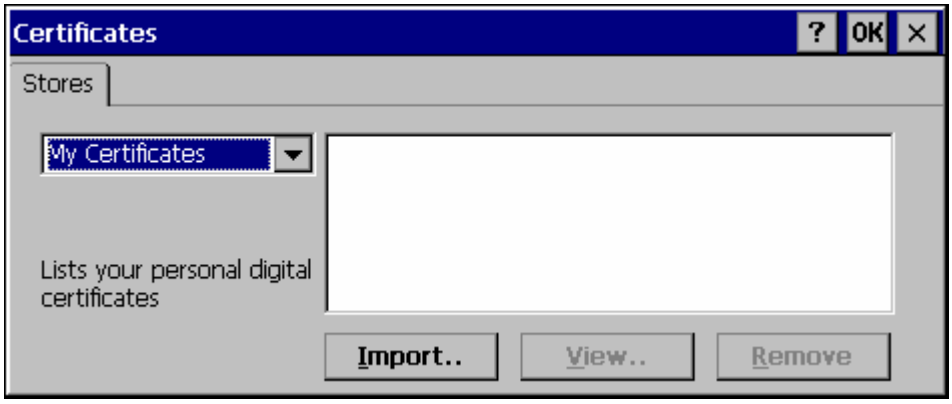


Figure 5-84 Certificates

Click the “Import” button.

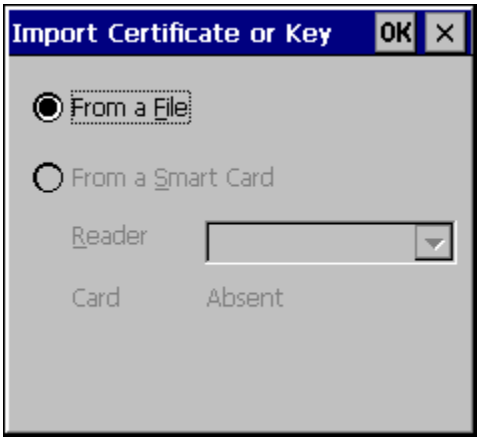


Figure 5-85 Import Certificate

Make sure “From a File” is selected and click OK.

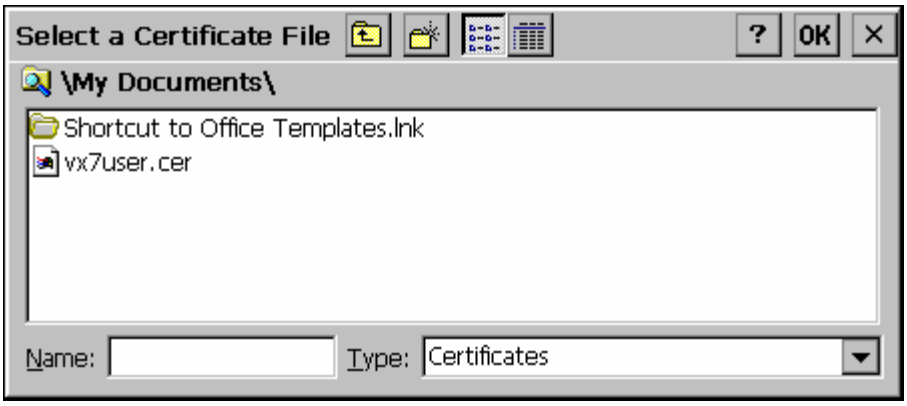


Figure 5-86 Browsing to Certificate Location

Using the explorer buttons, browse to the location where you copied the certificate, select the certificate desired and click OK.

The certificate is now shown in the list.

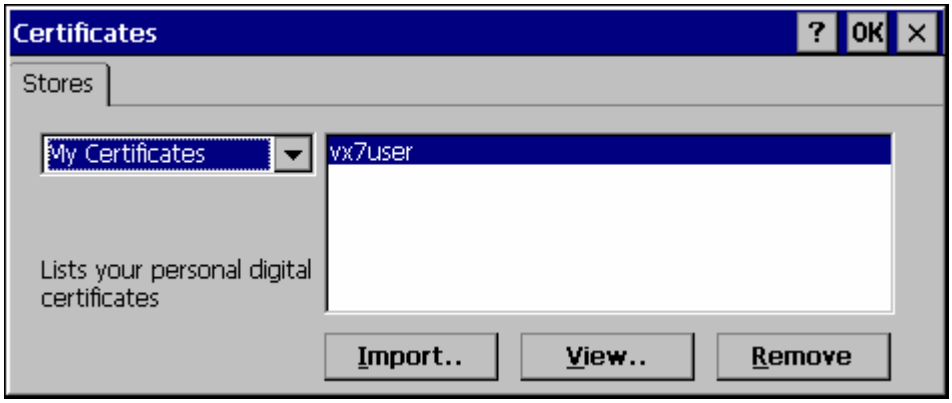


Figure 5-87 Certificate Listing

With the certificate you just imported highlighted, click View.

From the Field pull down menu, select “Private Key.

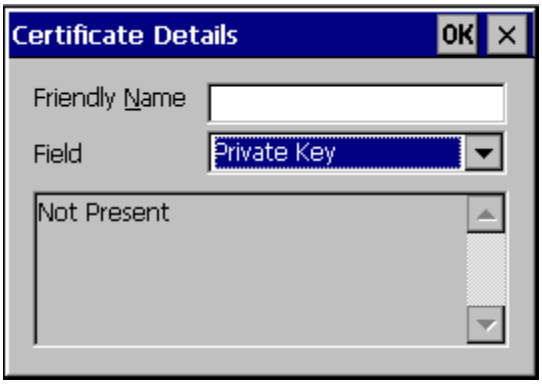


Figure 5-88 Private Key Not Present

- If the private key is present, the process is complete.
- If the private key is not present, import the private key.

To import the private key, click OK to return to the Certificates screen.

Click import.

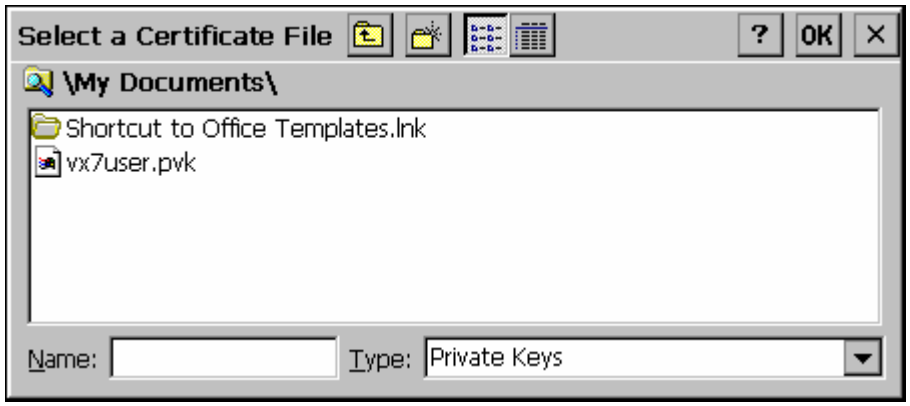


Figure 5-89 Browsing to Private Key Location

Using the explorer buttons, browse to the location where you copied the private key file, change the Type pull down list to “Private Keys”, select the certificate desired and click OK. Enter the password for the certificate if appropriate.

Click on View to see the certificate details again.

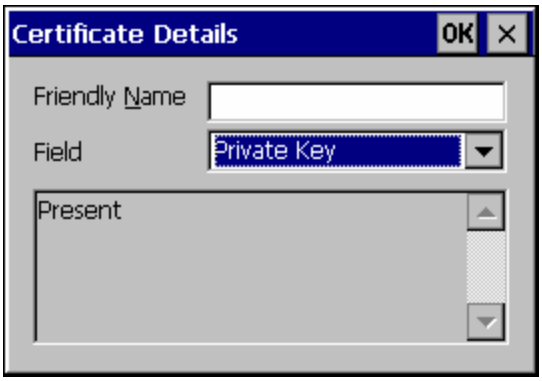


Figure 5-90 Private Key Present

The private key should now say present. If it does not, there is a problem. Possible items to check:

- Make sure the certificate was generated with a separate private key file, as shown earlier in this section. If the certificate was not generated with a separate private key file, generate a new certificate and follow the import process again.
- Make sure the certificate and private key file have the same name, for example vx7user.cer for the certificate and vx7user.pvk for the private key file. If the file names are not the same, rename the private key file and import it again.

Chapter 6 AppLock

Introduction

Note: LXE has made the assumption, in this chapter, that the first user to power up a new mobile device is the system administrator.

LXE's AppLock is designed to be run on LXE certified Windows CE based devices only. LXE loads the AppLock program as part of the LXE customer installation process.

Configuration parameters are specified by the AppLock Administrator for the mobile device end-user. AppLock is password protected by the Administrator.

End-user mode locks the end-user into the configured application or applications. The end user can still reboot the mobile device and respond to dialog boxes. The administrator-specified application is automatically launched and runs in full screen mode when the device boots up.

When the mobile device is reset to factory default values, for example after a cold reset, the Administrator may need to reconfigure the AppLock parameters.

Sections in this chapter that are not specifically Multi-Application or Single Application are used/changed in the same way by both versions.

Note: To reset the device to factory default values, please refer to Chapter 4 "System Configuration" section titled "Utilities" and the RegClear, PSMFormat and ColdBoot executable files.

Setup a New Device

LXE devices with the AppLock feature are shipped to boot in Administration mode with no default password, thus when the device is first booted, the user has full access to the device and no password prompt is displayed. After the administrator specifies an application to lock, a password is assigned and the device is rebooted or the hotkey is pressed, the device switches to end-user mode.

Briefly, the process to configure a new device is as follows:

1. Insert a fully charged battery and press the Power button.
2. Connect an external power source to the device (if required).
3. Adjust screen display, audio volume and other parameters if desired. Install accessories (e.g. handstrap, stylus).
4. Tap **Start | Settings | Control Panel | Administration** icon.
5. Assign an application on the **Control** (single application) or **Application** (dual application) tab screen.
6. Assign a password on the Security tab screen.
7. Select a view level on the Status tab screen, if desired.
8. Tap OK
9. Press the hotkey sequence to launch AppLock and lock the configured application(s).
10. The device is now in end-user mode.

Important: Before setting up multiple application parameters, make sure the targeted software applications will allow two versions to run at the same time.

Multi-Application Version

Access: Settings | Control Panel | Administration icon

A mobile device running the Multi-Application version of AppLock becomes a dedicated, dual application device. Only the applications or features specified in the AppLock configuration by the Administrator are available to the end-user. This version offers a user-mode taskbar icon allowing the end-user to switch between user applications.

See section titled *Multi-Application Configuration* for information and instruction.

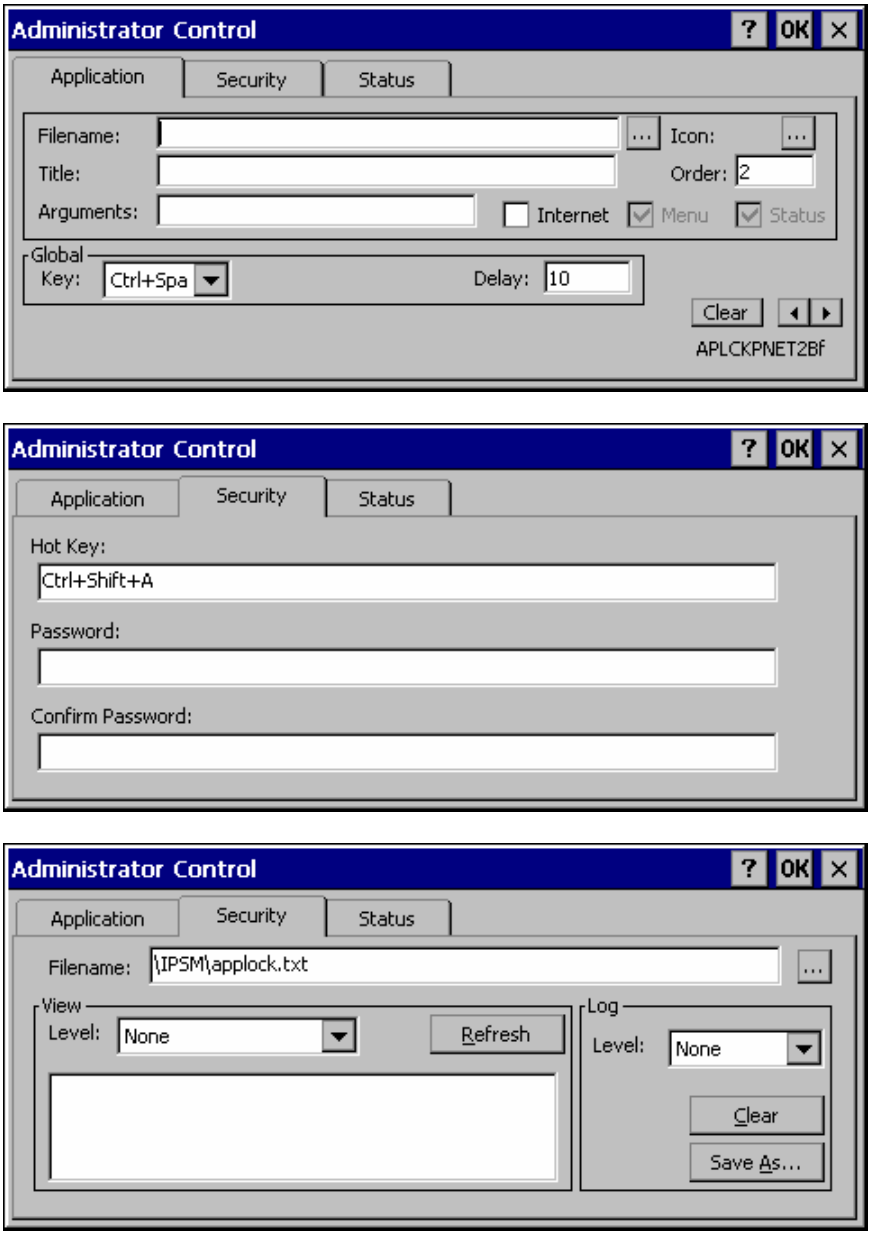


Figure 6-1 Administrator Control Panels – Multi-Application

Single Application Version

Access: **Settings | Control Panel | Administration icon**

A mobile device running the Single Application version of AppLock becomes a dedicated, single application device. In other words, only the application or feature specified in the AppLock configuration by the Administrator is available to the user.

See section titled *Single Application Configuration* for information and instruction.

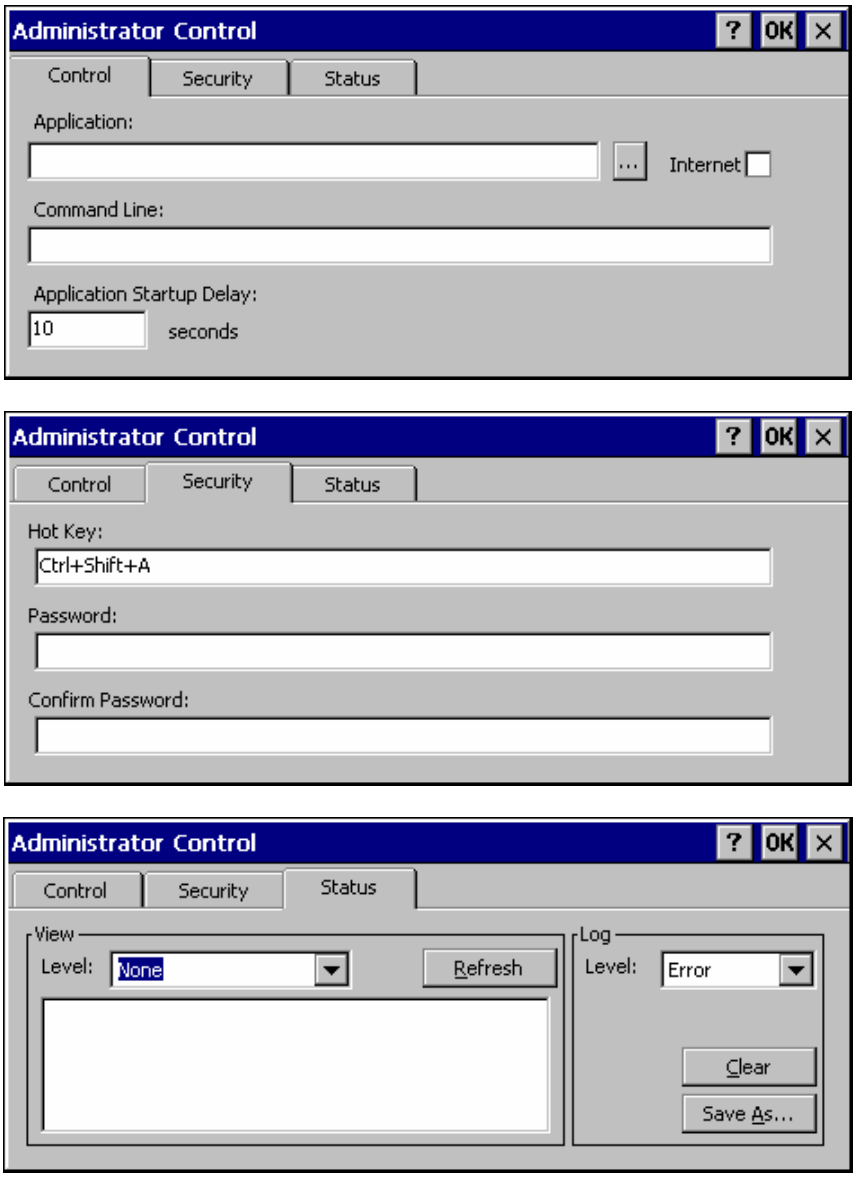


Figure 6-2 Administrator Control Panels – Single Application

Administration Mode

Administration mode gives full access to the mobile device, hardware and software configuration options.

The administrator must enter a valid password (when a password has already been assigned) before access to Administration mode and configuration options are allowed. The administrator can configure the following options:

1. Create/change the keystroke sequence to activate administrator access.
2. Create/change the password for administrator access.
3. Assign the name of the application, or applications, to lock.
4. Select the command line of the application to lock.

In addition to these configuration options, the administrator can view and manage the status logs of AppLock sessions.

Administrator default values for this device:

Administrator Hotkey	Shift+Ctrl+A
Password	none
Application path and name	none
Application command line	none

End User Mode

End-user mode locks the end-user into the configured application or applications. The end user can still reboot and respond to dialog boxes. Each application is automatically launched and runs in full screen mode when the device boots up.

The user cannot unintentionally or intentionally exit the application nor can the end user execute any other applications. Normal application exit or switching methods and all Microsoft defined Windows CE key combinations, such as close (X) icon, File Exit, File Close, Alt-F4, Alt-Tab, etc. are disabled. The Windows CE desktop icons, menu bars, task bar and system trays are not visible or accessible. Task Manager is not available.

If the end-user selects File/Exit or Close from the applications menu bar, the menu is cleared and nothing else happens; the application remains active. Nothing happens when the end-user clicks on the Close icon on the application's title bar and the application remains active.

Note: A few applications do not follow normal procedures when closing. AppLock cannot prevent this type of application from closing, but is notified that the application has closed. For these applications, AppLock immediately restarts the application which causes the screen to flicker. If this type of application is being locked, the administrator should close all other applications before switching to end user mode to minimize the screen flicker.

Windows accelerator keys such as Alt-F4 are disabled.

Passwords

A password must be configured. If the password is not configured, a new device switches into Administration mode without prompting for a password. In addition to the hotkey press, a mode switch occurs if inaccurate information has been configured or if mandatory information is missing in the configuration.

There are several situations that display a password prompt after a password has been configured.

If the configured hotkey is pressed, the password prompt is displayed. In this case the user has 30 seconds to enter a password. If a valid password is not entered within 30 seconds, the password prompt is dismissed and the device returns to end-user mode.

All other situations that present the password prompt do not dismiss the prompt -- this is because the other situations result in invalid end-user operation.

These conditions include:

1. If inaccurate configuration information is entered by the administrator, i.e. an application is specified that does not exist.
2. If the application name, which is mandatory for end-user mode, is missing in the configuration.
3. Invalid installation of AppLock (e.g. missing DLLs).
4. Corrupted registry settings.

To summarize, if an error occurs that prevents AppLock from switching to user mode, the password will not timeout and AppLock will wait until the correct password is entered.

Troubleshooting

Can’t locate the password that has been set by the administrator? Enter this LXE back door key sequence:

Ctrl+L Ctrl+X Ctrl+E

Multi-Application Configuration

The default Administrator Hotkey sequence is **Shift+Ctrl+A.**

Administrator mode allows access to all features on the device. When the hotkey is pressed to switch into Administrator mode, a password prompt is displayed (if a password has been configured). A password must be entered within 30 seconds (and within three tries) or the password prompt is removed and the device remains in end-user mode with the focus returned to the locked application. Without entry of a valid password, the switch into Administrator mode will not occur.

Access: **Settings | Control Panel | Administration icon**

The password prompt is displayed if a password has been configured. When the valid password is entered, the Administration Control panel is displayed. When a valid password is not entered within 30 seconds, the user is returned to the System Control Panel.

If a password has not been configured, the Administrator Control panel is displayed.

Important: Before setting up multiple instances of the same application, make sure the targeted software application will allow two instances to run at the same time.

Application Panel

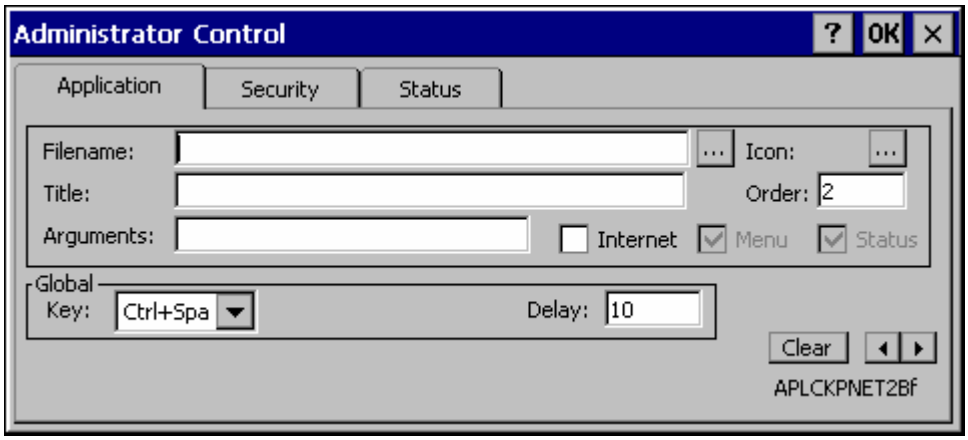


Figure 6-3 Application Panel – Multi-Application

Note: If your Application Panel does not look like the figure shown above, you may have the Single Application version.

Use the **Application** tab options to select the applications to launch when the device boots up in End User Mode.

Move the cursor to the **Filename** text box and either type the application path or tap the Browse button (the … button). The standard Windows CE Browse dialog is displayed. After selecting the application from the Browse dialog, tap OK.

Enter the **Title** to be associated with the application's icon. The assumption is that multiple copies of the same application may need unique text for the icon in order to differentiate them in the application switcher panel.

Enter the command line parameters for the application in the **Arguments** text box.

Enter the **Order** in which the application is to be loaded or presented to the end user. Applications are launched in lowest to highest number order.

Enable the **Internet** checkbox to use the End User Internet Explorer (EUIE.EXE) When the checkbox is enabled, the Internet **Menu** and Internet **Status** are available. See the section titled *End User Internet Explorer* for more details.

Select the **Global Key** key sequence the end user is to press when switching between applications. The Global Key default key sequence is **Ctrl+Spc**. The Global key is selected from a predefined list of Global hotkey combinations. The Global key is presented to the end-user as the *Activation* key.

Enter the number of seconds in **Global Delay** that both Applications must wait before starting to run upon reboot.

Tap the **Clear** button to clear all Application information that are currently displayed. The Global settings remain the same for both applications.

Use the left and right **scroll buttons** to move from application setup screen to application setup screen. The left and right buttons update the information on the screen with the previous or next configured application respectively.

If no application is specified when the Administrator Control applet is closed, the device reboots into Administrator mode. If a password has been set, but an application has not been specified, the user will be prompted for the password before entering administration mode. The password prompt remains on the display until a valid password is entered.

End User Internet Explorer (EUIE)

AppLock supports applications that utilize Internet Explorer, such as .HTML pages and JAVA applications. The end user can run an application by entering the application name and path in Internet Explorer's address bar.

To prevent the end user from executing an application using this method, the address bar and Options settings dialog are restricted in Internet Explorer. This is accomplished by creating an Internet Explorer that is used in end user mode: End-user Internet Explorer (EUIE.EXE). The EUIE executes the Internet Explorer application in full screen mode which removes the address bar and status bar. The Options Dialog is also removed so the end user cannot re-enable the address bar.

The administrator specifies the EUIE by checking the **Internet** checkbox in the Application tab of the Administrator applet. The internet application should then be entered in the **Application** text box.

When the Internet checkbox is enabled, the **Menu** and **Status** check boxes are available.

Enabling the **Menu** checkbox displays the EUIE's menu which contains navigation functions like Back, Forward, Home, Refresh, etc., functions that are familiar to most Internet Explorer users. When the Menu checkbox is blank, the EUIE menu is not displayed and Navigation functions are unavailable.

When the **Status** checkbox is enabled, the status bar displayed by EUIE gives feedback to the end-user when they are navigating the Internet.

If the standard Internet Explorer that is shipped with the mobile device is desired, it should be treated like any other application. This means that IEXPLORER.EXE should be specified in the Application text box and the internet application should be entered in the command line. In this case, do not check the Internet checkbox.

Security Panel

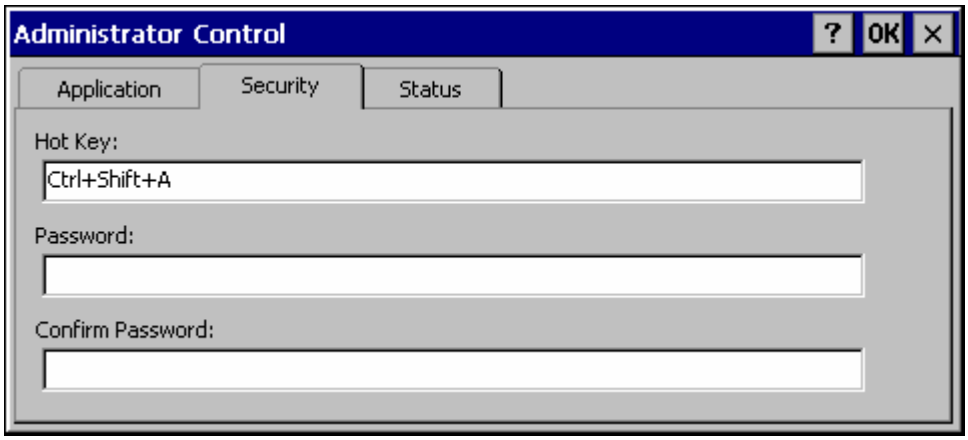


Figure 6-4 Security Panel – Multi-Application

Hotkey

Specify the hotkey sequence that triggers AppLock to switch between administrator and user modes and the password required to enter Administrator mode. The default hotkey sequence is **Shift+Ctrl+A**.

A 2nd key keypress is an invalid keypress for a hotkey sequence.

Move the cursor to the Hot Key text box. Enter the new hot key sequence by first pressing the Shift state key followed by a normal key. The hotkey selected must be a key sequence that the application being locked does not use. The hotkey sequence is intercepted by AppLock and is not passed to the application.

Input from the keyboard or Input Panel is accepted with the restriction that the normal key must be pressed from the keyboard when switching modes. The hotkey sequence is displayed in the Hot key text box with "Shift", "Alt", and "Ctrl" text strings representing the shift state keys. The normal keyboard key completes the hotkey sequence. The hotkey must be entered via the keypad. Some hotkeys cannot be entered via the Input Panel. Also, hotkeys entered via the SIP are not guaranteed to work properly when switching operational modes.

For example, if the 'Ctrl' key is pressed followed by 'A', "Ctrl+A" is entered in the text box. If another key is pressed after a normal key press, the hotkey sequence is cleared and a new hotkey sequence is started.

A normal key is required for the hotkey sequence and is unlike pressing the normal key during a mode switch; this key can be entered from the SIP when configuring the key. However, when the hotkey is pressed to switch modes, the normal key must be entered from the keypad; it cannot be entered from the SIP.

Password

Move the cursor to the Password text box. The passwords entered in the Password and Confirm Password fields must match. Passwords are case sensitive.

When the user exits the Administrator Control panel, the two passwords are compared to verify that they match. If they do not match, a dialog box is displayed notifying the user of the error. After the user closes the dialog box, the Security Panel is displayed and the password can then be entered and confirmed again. If the passwords match, the password is encrypted and saved.

See Also: *Passwords* and *Troubleshooting Multi-Application AppLock*

Status Panel

Use the Status panel to view the log of previous AppLock operations and to configure which messages are to be recorded during AppLock operation.

Status information is stored in a specific location on the storage device and in a specific logfile specified by the Administrator. For this reason, the administrator can configure the type of status information that is logged, as well as clear the status information.

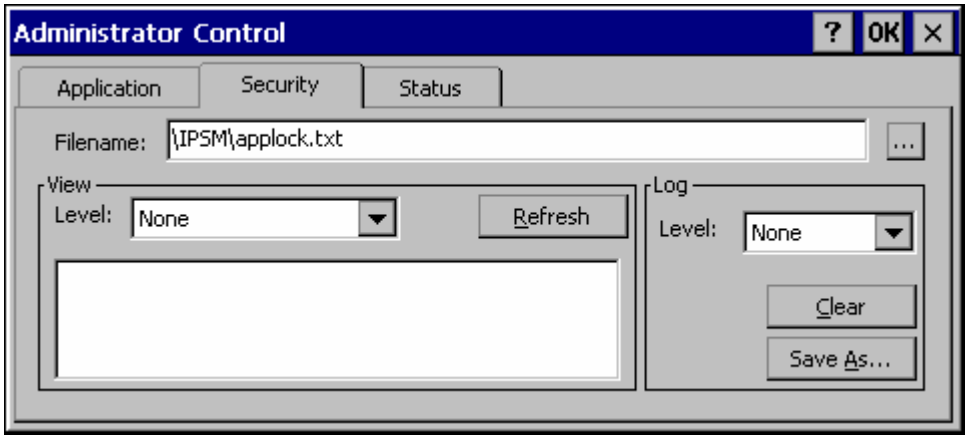


Figure 6-5 Status Panel – Multi-Application

Move the cursor to the **Filename** text box and either type the logfile path or tap the Browse button (the … button). The standard Windows CE Browse dialog is displayed. After selecting the logfile from the Browse dialog, tap OK.

Note: If your Status Panel does not look like the figure shown above, you may have the Single Application version.

View

Error	Error status messages are logged when an error occurs and is intended to be used by the administrator to determine why the specified application cannot be locked.
Process	Processing status shows the flow control of AppLock components and is mainly intended for LXE Customer Service when helping users troubleshoot problems with their AppLock program.
Extended	Extended status provides more detailed information than that logged by Process Logging.
All	All messages are displayed.

Tap the Refresh button after changing from one view level to another. The filtered records are displayed, all others are not displayed.

Log

Note: ***If a level higher than Error is selected, the status should be cleared frequently by the administrator.***

In addition to the three view levels the administrator can select that all status information be logged or turn off all status information logging completely. The system default is 'None'; however to reduce registry use, the administrator may want to select 'None' after verifying the configuration. Tap the Clear button to clear the status information from the registry.

- None
- Error
- Processing
- Extended
- All

Save As

When the 'Save As'… button is selected, a standard 'Save As' dialog screen is displayed. Specify the path and filename. If the filename exists, the user is prompted whether the file should be overwritten. If the file does not exist, it is created.

See Also: *Error Messages*

End-User Switching Technique

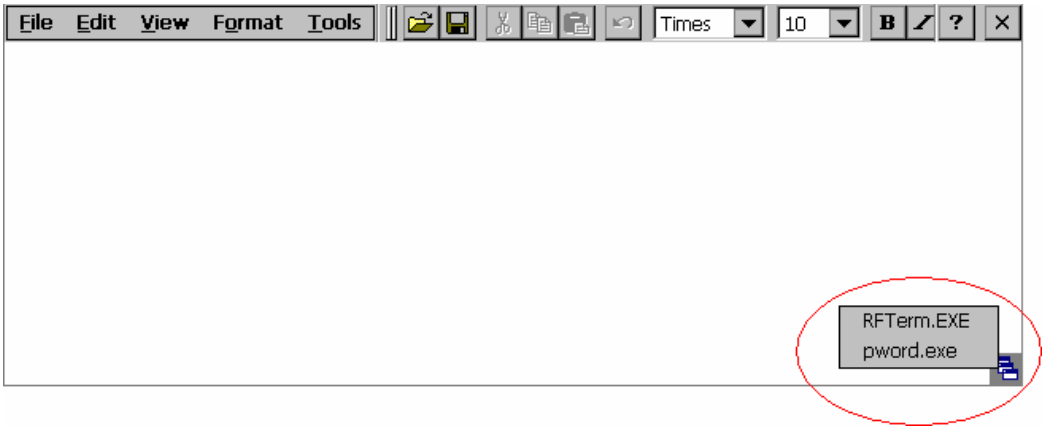


Figure 6-6 End-User Multi-Application Touch Panel

Using a Stylus Tap

When the mobile device enters end-user mode, a taskbar icon is available to the user so they can switch between the locked applications. The touchscreen must be enabled on the mobile device before the taskbar icon can be used. The taskbar is always visible on top of the application in focus.

When the taskbar icon is tapped, a menu is displayed showing the applications available to the user. The user then taps the application name in the popup menu and the selected application is brought to the foreground. The previous application continues to run in the background. Stylus taps affect the application in focus only.

The appearance of the taskbar is different on various mobile device platforms and may differ from the example shown above. This example is shown only to aid in describing how the user can switch between applications using a stylus. If RFTerm and Microsoft Word were the two applications locked, a switching icon showing both applications is displayed on the screen.

Using a Hotkey Sequence

One hotkey is defined for the end-user to key in when switching between locked applications. This is known as the **Activation** key. The Activation key is assigned by the Administrator using the Global Key parameter. When the hotkey or hotkey sequence is pressed on the keypad, the next application in the AppLock configuration is moved to the foreground and the previous application moves to the background. The previous application continues to run in the background but end-user key presses affect the application in focus only.

Troubleshooting Multi-Application AppLock

The mobile device won't switch from Administration mode to end-user mode.

- If the configuration is valid for one application but not the other, the switch to end-user mode fails. AppLock stays in Administration mode and is stopped until the Administrator password is entered.
- If two copies of the same application are configured, but the application only allows one copy to run at a time, for example Microsoft Pocket Word, the switch to end-user fails. AppLock stays in Administration mode and is stopped until the Administrator password is entered.

The hotkey sequence needed is not allowed. What does this mean?

When the Administrator is selecting a hotkey sequence to use when switching user modes, they are not allowed to enter key combinations that are reserved by installed software applications. LXE has validated RFTerm key combinations ONLY.

When RFTerm is installed on the mobile device and an RFTerm restricted key sequence is specified as a hotkey sequence by the Administrator, the following error message is displayed in a message box:

> Selected hotkey is not allowed. Please reenter.

When RFTerm is not installed on the mobile device, the RFTerm keys are not restricted from use.

Single Application Configuration

The default Administrator Hotkey sequence is **Shift+Ctrl+A.**

Administrator mode allows access to all features on the device. When the hotkey is pressed to switch into Administrator mode, a password prompt is displayed (if a password has been configured). A password must be entered within 30 seconds (and within three tries) or the password prompt is removed and the device remains in end-user mode with the focus returned to the locked application. Without entry of a valid password, the switch into Administrator mode will not occur.

Access: **Settings | Control Panel | Administration icon**

The password prompt is displayed if a password has been configured. When the valid password is entered, the Administration Control panel is displayed. When a valid password is not entered within 30 seconds, the user is returned to the System Control Panel.

If a password has not been configured, the Administrator Control panel is displayed.

Control Panel

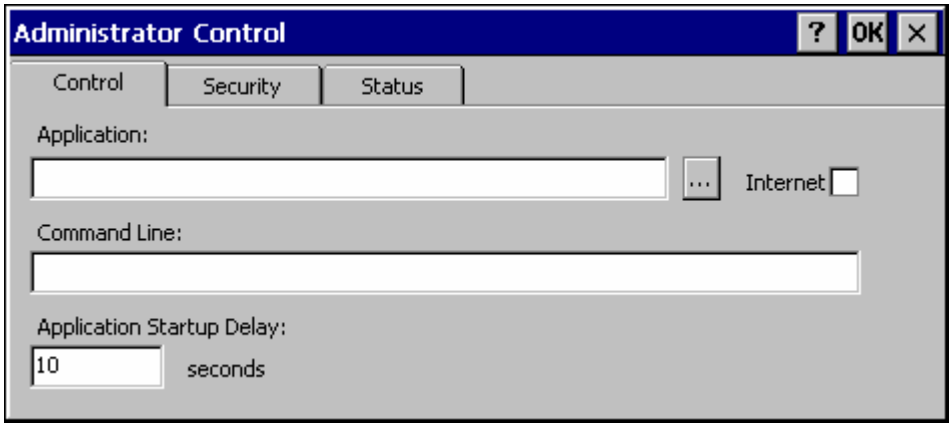


Figure 6-7 Administrator Control Panel

Note: If your Administrator Control Panel does not look like the figure shown above, you may have the Multi-Application version.

Use the Control tab options to select the application to launch when the device boots up.

Move the cursor to the **Application** text box and either type the application path or click the Browse button (the … button). The standard Windows CE .NET Browse dialog is displayed. After selecting the application from the Browse dialog, tap OK.

Enter the command line parameters for the application in the Command Line text box.

Enter the number of seconds the selected Application must wait before starting to run upon reboot.

If no application is specified when the Administrator Control panel is closed, the device reboots into Administrator mode. If a password has been set, but the application has not been specified, the user will be prompted for the password before entering administration mode. The password prompt remains on the display until a valid password is entered.

End User Internet Explorer

AppLock supports applications that utilize Internet Explorer, such as .HTML pages and JAVA applications. The end user can run an application by entering the application name and path in Internet Explorer's address bar.

To prevent the end user from executing an application using this method, the address bar and Options settings dialog are restricted in Internet Explorer. This is accomplished by creating an Internet Explorer that is used in end user mode, End-user Internet Explorer (EUIE). The EUIE executes the Internet Explorer application in full screen mode which removes the address bar and status bar. The Options Dialog is also removed so the end user cannot re-enable the address bar.

The administrator specifies the EUIE by simply checking the "Internet" checkbox in the Control tab of the Administrator applet. The internet application should then be entered in the "Application" text box. If the standard Internet Explorer that is shipped with the device is desired, it should be treated like any other application. This means that IEXPLORER.EXE should be specified in the Application text box and the internet application should be entered in the command line. In this case, do not check the Internet checkbox.

Security Panel

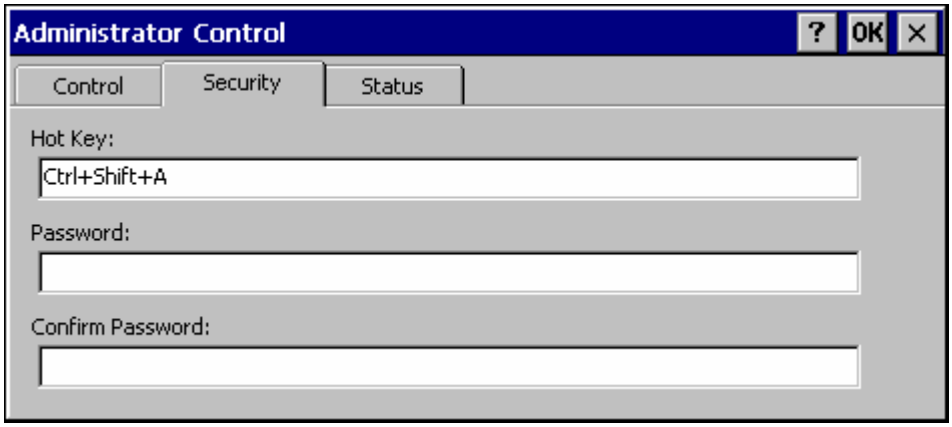


Figure 6-8 Administrator Security Panel

Hotkey

Specify the hotkey sequence that triggers AppLock to switch between administrator and user modes and the password required to enter Administrator mode. The default hotkey sequence is **Shift+Ctrl+A**.

A 2nd key keypress is an invalid keypress for a hotkey sequence.

Note: Some key combinations cannot be specified because they conflict with the key combinations used by other LXE applications. The message "Selected hotkey is not allowed, Please re-enter" is displayed. A different Hotkey must be entered.

Move the cursor to the Hot Key text box. Enter the new hot key sequence by first pressing the Shift state key followed by a normal key. The hotkey selected must be a key sequence that the application being locked does not use. The hotkey sequence is intercepted by AppLock and is not passed to the application.

Input from the keyboard or Input Panel is accepted with the restriction that the normal key must be pressed from the keyboard when switching modes. The hotkey sequence is displayed in the Hot key text box with “Shift”, “Alt”, and “Ctrl” text strings representing the shift state keys. The normal keyboard key completes the hotkey sequence.

For example, if the ‘Ctrl’ key is pressed followed by ‘A’, “Ctrl+A” is entered in the text box. If another key is pressed after a normal key press, the hotkey sequence is cleared and a new hotkey sequence is started.

A normal key is required for the hotkey sequence and unlike pressing the normal key during a mode switch; this key can be entered from the SIP when configuring the key. However, when the hotkey is pressed to switch modes, the normal key must be entered from the keypad; it cannot be entered from the SIP.

Password

Move the cursor to the Password text box. The passwords entered in the Password and Confirm Password fields must match. Passwords are case sensitive.

When the user exits the Administrator Control panel, the two passwords are compared to verify that they match. If they do not match, a dialog box is displayed notifying the user of the error. After the user closes the dialog box, the Security Panel is displayed and the password can then be entered and confirmed again. If the passwords match, the password is encrypted and saved.

See Also: Passwords

Status Panel

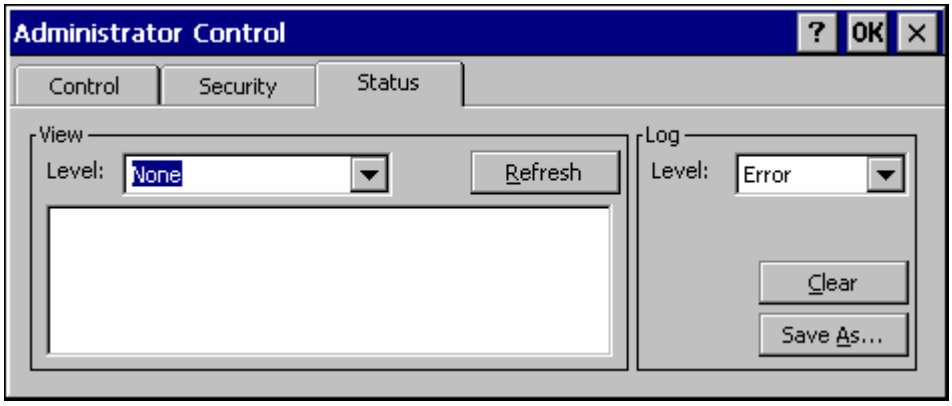


Figure 6-9 Administrator Status Panel

Use the Status panel to view the log of previous AppLock operation and to configure which messages are to be recorded during AppLock operation.

As the status information is stored in the registry and accumulates during AppLock configuration and operation, it is very important that the administrator periodically clear the status information to reduce the amount of registry space used. For this reason, the administrator can configure the type of status information that is logged, as well as clear the status information.

View

Error	Error status messages are logged when an error occurs and is intended to be used by the administrator to determine why the specified application cannot be locked.
Process	Processing status shows the flow control of AppLock components and is mainly intended for LXE Customer Service when helping users troubleshoot problems with their AppLock program.
Extended	Extended status provides more detailed information than that logged by Process Logging.
All	All messages are displayed.

Tap the Refresh button after changing from one view level to another. The filtered records are displayed, all others are not displayed.

Levels

Note: ***If a level higher than Error is selected, the status should be cleared frequently by the administrator.***

In addition to the three view levels the administrator can select that all status information be logged or turn off all status information logging completely. The system default is Error Logging; however to reduce registry use, the administrator may want to select 'None' after verifying the configuration. Tap the Clear button to clear the status information from the registry.

- None
- Error
- Processing
- Extended
- All

Save As

When the 'Save As'… button is selected, a standard 'Save As' dialog screen is displayed. Specify the path and filename. If the filename exists, the user is prompted whether the file should be overwritten. If the file does not exist, it is created.

See Also: Error Messages

Error Messages

Any messages whose first word is an 'ing' word is output prior to the action described in the message. For example, "Switching to admin-hotkey press" is logged after the administrator has pressed the hotkey but prior to starting the switch process.

For all operations that can result in an error, an Error level message is displayed when a failure occurs. These messages contain the word "failure". These messages have a partner Extended level message that is logged which contains the word "OK" if the action completed successfully rather than with an error.

For processing level messages, "Enter…" is logged at the beginning of the function specified in the message and "Exit…" is logged at the end (just before the return) of the function specified in the message.

Message	Explanation and/or corrective action	Level
Error reading hotkey; using default	A hotkey is required. If there is a failure reading the hotkey, the internal factory default is used.	LOG_ERROR
App Command Line= <Command line>	Command line of the application being locked	LOG_PROCESSING
App= <Application name>	Name of the application being locked	LOG_PROCESSING
dwProcessID= <#>	Device ID of the application being locked	LOG_EX
Encrypt exported key len <#>	Size of encrypt export key	LOG_EX
Encrypt password length= <#>	The length of the encrypted password.	LOG_EX
Encrypted data len <#>	Length of the encrypted password	LOG_EX
hProcess= <#>	Handle of the application being locked	LOG_EX
Key pressed = <#>	A key has been pressed and trapped by the hotkey processing.	LOG_EX
**********	The status information is being saved to a file and the file has been opened successfully.	LOG_EX
Address of keyboard hook procedure failure	Applock found the kbdhook.dll, but was unable to get the address of the initialization procedure. For some reason the dll is corrupted. Look in the \Windows directory for kbdhook.dll. If it exists, delete it. Also delete applock.exe from the \Windows directory and reboot the unit. Deleting applock.exe triggers the applock system to reload.	LOG_ERROR

Message	Explanation and/or corrective action	Level
Address of keyboard hook procedure OK	Applock successfully retrieved the address of the keyboard filter initialization procedure.	LOG_EX
Alt pressed	The Alt key has been pressed and trapped by the HotKey processing.	LOG_EX
Alt	Processing the hotkey and backdoor entry	LOG_EX
Application handle search failure	The application being locked did not complete initialization.	LOG_ERROR
Application handle search OK	The application initialized itself successfully	LOG_ERROR
Application load failure	The application could not be launched by AppLock; the application could not be found or is corrupted.	LOG_ERROR
Backdoor message received	The backdoor keys have been pressed. The backdoor hotkeys provide a method for customer service to get a user back into their system without editing the registry or reloading the device.	LOG_PROCESSING
Cannot find kbdhook.dll	The load of the keyboard filter failed. This occurs when the dll is missing or is corrupted. Look in the \Windows directory for kbdhook.dll. If it exists, delete it. Also delete applock.exe from the \Windows directory and reboot the unit. Deleting applock.exe triggers the applock system to reload.	LOG_ERROR
Converted Pwd	Converted password from wide to mbs.	LOG_EX
Could not create event EVT_HOTKEYCHG	The keyboard filter uses this event at the Administrator Control panel. The event could not be created.	LOG_ERROR
Could not hook keyboard	If the keyboard cannot be controlled, AppLock cannot process the hotkey. This failure prevents a mode switch into user mode.	LOG_ERROR
Could not start thread HotKeyMon	The keyboard filter must watch for hot key changes. The watch process could not be initiated.	LOG_ERROR
Ctrl after L or X	Processing the backdoor entry.	LOG_EX
Ctrl pressed	The Ctrl key has been pressed and trapped by the HotKey processing.	LOG_EX
Ctrl	Processing the hotkey and backdoor entry.	LOG_EX
Decrypt acquire context failure	Unable to decrypt password.	LOG_ERROR
Decrypt acquired context OK	Decryption process ok.	LOG_EX
Decrypt create hash failure	Unable to decrypt password.	LOG_ERROR
Decrypt created hash OK	Decryption process ok.	LOG_EX

Message	Explanation and/or corrective action	Level
Decrypt failure	Unable to decrypt password.	LOG_ERROR
Decrypt import key failure	Unable to decrypt password.	LOG_ERROR
Decrypt imported key OK	Decryption process ok.	LOG_EX
Encrypt acquire context failure	Unable to encrypt password.	LOG_ERROR
Encrypt acquire encrypt context failure	Unable to encrypt password.	LOG_ERROR
Encrypt acquired encrypt context OK	Encrypt password process successful.	LOG_EX
Encrypt create hash failure	Unable to encrypt password.	LOG_ERROR
Encrypt create key failure	Unable to encrypt password.	LOG_ERROR
Encrypt created encrypt hash OK	Encrypt password process successful.	LOG_EX
Encrypt export key failure	Unable to encrypt password.	LOG_ERROR
Encrypt export key length failure	Unable to encrypt password.	LOG_ERROR
Encrypt exported key OK	Encrypt password process successful.	LOG_EX
Encrypt failure	The password encryption failed.	LOG_ERROR
Encrypt gen key failure	Unable to encrypt password.	LOG_ERROR
Encrypt generate key failure	Unable to encrypt password.	LOG_ERROR
Encrypt get user key failure	Unable to encrypt password.	LOG_ERROR
Encrypt get user key ok	Encrypt password process successful.	LOG_EX
Encrypt hash data failure	Unable to encrypt password.	LOG_ERROR
Encrypt hash data from pwd OK	Encrypt password process successful.	LOG_EX
Encrypt length failure	Unable to encrypt password.	LOG_ERROR
Encrypt out of memory for key	Unable to encrypt password.	LOG_ERROR
Encrypted data OK	The password has been successfully encrypted.	LOG_EX
Enter AppLockEnumWindows	In order for AppLock to control the application being locked so it can prevent the application from exiting, AppLock launches the application and has to wait until it has created and initialized its main window. This message is logged when the function that waits for the application initialization is entered.	LOG_EX

Message	Explanation and/or corrective action	Level
Enter DecryptPwd	Entering the password decryption process.	LOG_PROCESSING
Enter EncryptPwd	Entering the password encryption processing.	LOG_PROCESSING
Enter FullScreenMode	Entering the function that switches the screen mode. In full screen mode, the taskbar is hidden and disabled.	LOG_PROCESSING
Enter GetAppInfo	Processing is at the beginning of the function that retrieves the application information from the registry.	LOG_PROCESSING
Enter password dialog	Entering the password dialog processing.	LOG_PROCESSING
Enter password timeout	Entering the password timeout processing.	LOG_PROCESSING
Enter restart app timer	Some application shut down before AppLock can stop it. In these cases, AppLock gets notification of the exit. When the notification is received, AppLock starts a timer to restart the application. This message logs that the timer has expired and the processing is at the beginning of the timer function.	LOG_PROCESSING
Enter TaskbarScreenMode	Entering the function that switches the screen to non-full screen mode and enable the taskbar.	LOG_PROCESSING
Enter ToAdmin	Entering the function that handles a mode switch into admin mode.	LOG_PROCESSING
Enter ToUser	Entering the function that handles the mode switch to user mode	LOG_PROCESSING
Enter verify password	Entering the password verification processing.	LOG_PROCESSING
Exit AppLockEnumWindows-Found	There are two exit paths from the enumeration function. This message denotes the enumeration function found the application.	LOG_PROCESSING
Exit AppLockEnumWindows-Not found	There are two exit paths from the enumeration function. This message denotes the enumeration function did not find the application.	LOG_PROCESSING
Exit DecryptPwd	Exiting password decryption processing.	LOG_PROCESSING
Exit EncryptPwd	Exiting password encryption processing.	LOG_PROCESSING
Exit FullScreenMode	Exiting the function that switches the screen to full screen.	LOG_PROCESSING
Exit GetAppInfo	Processing is at the end of the function that retrieved the application information from the registry.	LOG_PROCESSING
Exit password dialog	Exiting password prompt processing.	LOG_PROCESSING
Exit password dialog-cancel	Exiting password prompt w/cancel.	LOG_PROCESSING

Message	Explanation and/or corrective action	Level
Exit password dialog-OK	Exiting password prompt successfully.	LOG_PROCESSING
Exit password timeout	Exiting password timeout processing.	LOG_PROCESSING
Exit restart app timer	Processing is at the end of the timer function	LOG_PROCESSING
Exit TaskbarScreenMode	Exiting the function that switches the screen mode back to normal operation for the administrator.	LOG_PROCESSING
Exit ToAdmin	Exiting the function that handles the mode switch into admin mode.	LOG_PROCESSING
Exit ToUser	Exiting the user mode switch function.	LOG_PROCESSING
Exit ToUser-Registry read failure	The AppName value does not exist in the registry so user mode cannot be entered.	LOG_PROCESSING
Exit verify password-no pwd set	Exiting password verification.	LOG_PROCESSING
Exit verify password-response from dialog	Exiting password verification.	LOG_PROCESSING
Found taskbar	The handle to the taskbar has been found so that AppLock can disable it in user mode.	LOG_PROCESSING
Getting address of keyboard hook init procedure	AppLock is retrieving the address of the keyboard hook.	LOG_PROCESSING
Getting configuration from registry	The AppLock configuration is being read from the registry. This occurs at initialization and also at entry into user mode. The registry must be re-read at entry into user mode in case the administration changed the settings of the application being controlled.	LOG_PROCESSING
Getting encrypt pwd length	The length of the encrypted password is being calculated.	LOG_EX
Hook wndproc failure	AppLock is unable to lock the application. This could happen if the application being locked encountered an error after performing its initialization and shut itself down prior to being locked by AppLock.	LOG_ERROR
Hook wndproc of open app failure	The application is open, but AppLock cannot lock it.	LOG_ERROR
Hot key event creation failure	The Admin applet is unable to create the hotkey notification.	LOG_ERROR
Hot key pressed	Processing the hotkey and backdoor entry	LOG_EX
Hot key pressed	Processing the hotkey and backdoor entry	LOG_EX
Hot key set event failure	When the administrator changes the hotkey configuration the hotkey controller must be notified. This notification failed.	LOG_ERROR

Message	Explanation and/or corrective action	Level
Hotkey press message received	The user just pressed the configured hotkey.	LOG_PROCESSING
In app hook:WM_SIZE	In addition to preventing the locked application from exiting, AppLock must also prevent the application from enabling the taskbar and resizing the application's window. This message traps a change in the window size and corrects it.	LOG_EX
In app hook:WM_WINDOWPOSCHANGED	In addition to preventing the locked application from exiting, AppLock must also prevent the application from enabling the taskbar and resizing the application's window. This message traps a change in the window position and corrects it.	LOG_EX
Initializing keyboard hook procedure	Applock is calling the keyboard hook initialization.	LOG_PROCESSING
Keyboard hook initialization failure	The keyboard filter initialization failed.	LOG_ERROR
Keyboard hook loaded OK	The keyboard hook dll exists and loaded successfully.	LOG_EX
L after Ctrl	Processing the backdoor entry.	LOG_EX
Loading keyboard hook	When Applock first loads, it loads a dll that contains the keyboard hook processing. This message is logged prior to the load attempt.	LOG_PROCESSING
Open failure	The status information is being saved to a file and the file open has failed. This could occur if the file is write protected. If the file does not exist, it is created.	LOG_ERROR
Open registry failure	If the Administration registry key does not exist, the switch to user mode fails because the AppName value in the Administration key is not available.	LOG_ERROR
Opened status file	The status information is being saved to a file and the file has been opened successfully.	LOG_EX
Out of memory for encrypted pwd	Not enough memory to encrypt the password.	LOG_ERROR
pRealTaskbarWndProc already set	The taskbar control has already been installed.	LOG_EX
Pwd cancelled or invalid-remain in user mode	The password prompt was cancelled by the user or the maximum number of failed attempts to enter a password was exceeded.	LOG_EX
Read registry error-hot key	The hotkey registry entry is missing or empty. This is not considered an error. The keyboard hook uses an embedded default if the value is not set in the registry.	LOG_ERROR
Read registry failure-app name	AppName registry value does not exist or is empty. This constitutes a failure for switching into user mode.	LOG_ERROR

Message	Explanation and/or corrective action	Level
Read registry failure-Cmd Line	AppCommandLine registry entry is missing or empty. This is not considered an error since command line information is not necessary to launch and lock the application.	LOG_ERROR
Read registry failure-Internet	The Internet registry entry is missing or empty. This is not considered an error since the Internet value is not necessary to launch and lock the application.	LOG_ERROR
Registering Backdoor MSG	The AppLock system communicates with the keyboard hook via a user defined message. Both AppLock.exe and Kbdhook.dll register the message at initialization.	LOG_PROCESSING
Registering Hotkey MSG	The applock system communicates with the keyboard hook via a user defined message. Both Applock.exe and Kbdhook.dll register the message at initialization.	LOG_PROCESSING
Registry read failure at reenter user mode	The registry has to be read when entering user mode is the AppName is missing. This user mode entry is attempted at boot and after a hotkey switch when the administrator has closed the application being locked or has changed the the application name or command line.	LOG_ERROR
Registry read failure at reenter user mode	The registry has to be read when switching into user mode. This is because the administrator can change the settings during administration mode. The read of the registry failed which means the Administration key was not found or the AppName value was missing or empty.	LOG_ERROR
Registry read failure	The registry read failed. The registry information read when this message is logged is the application information. It the Adminstration key cannot be opened or if the AppName value is missing or empty, this error is logged. The other application information is not required. If the AppName value is not available, AppLock cannot switch into user mode.	LOG_ERROR
Reset system work area failure	The system work area is adjusted when in user mode to cover the taskbar area. The system work area has to be adjusted to exclude the taskbar area in administration mode. AppLock was unable to adjust this area.	LOG_ERROR
Shift pressed	The Shift key has been pressed and trapped by the HotKey processing.	LOG_EX
Shift	Processing the hotkey and backdoor entry	LOG_EX
Show taskbar	The taskbar is now being made visible and enabled.	LOG_PROCESSING
Switching to admin-backdoor	The system is currently in user mode and is now switching to admin mode. The switch occurred because of the backdoor key presses were entered by the administrator.	LOG_PROCESSING

Message	Explanation and/or corrective action	Level
Switching to admin-hotkey press	The system is currently in user mode and is now switching to admin mode. The switch occurred because of a hotkey press by the administrator.	LOG_PROCESSING
Switching to admin-kbdhook.dll not found	The keyboard hook load failed, so Applock switches to admin mode. If a password is specified, the password prompt is displayed and remains until a valid password is entered.	LOG_PROCESSING
Switching to admin-keyboard hook initialization failure	If the keyboard hook initialization fails, Applock switches to admin mode. . If a password is specified, the password prompt is displayed and remains until a valid password is entered.	LOG_PROCESSING
Switching to admin-registry read failure	See the explanation of the “Registry read failure” above. AppLock is switching into Admin mode. If a password has been configured, the prompt will be displayed and will not be dismissed until a valid password is entered.	LOG_PROCESSING
Switching to TaskbarScreenMode	In administration mode, the taskbar is visible and enabled.	LOG_EX
Switching to user mode	The registry was successfully read and AppLock is starting the process to switch to user mode.	LOG_PROCESSING
Switching to user-hotkey press	The system is currently in admin mode and is now switching to user mode. The switch occurred because of a hotkey press by the administrator.	LOG_PROCESSING
Taskbar hook failure	Applock is unable to control the taskbar to prevent the locked application from re-enabling it.	LOG_ERROR
Taskbar hook OK	AppLock successfully installed control of the taskbar.	LOG_EX
Timeout looking for app window	After the application is launched, AppLock must wait until the application has initialized itself before proceeding. The application did not start successfully and Applock has timed out.	LOG_ERROR
ToUser after admin, not at boot	The user mode switch is attempted when the device boots and after the administrator presses the hotkey. The mode switch is being attempted after a hotkey press.	LOG_EX
ToUser after admin-app still open	The switch to user mode is being made via a hotkey press and the administrator has left the application open and has not made any changes in the configuration.	LOG_EX
ToUser after admin-no app or cmd line change	If user mode is being entered via a hotkey press, the administrator may have left the configured application open. If so, AppLock does not launch the application again unless a new application or command line has been specified; otherwise, it just locks it.	LOG_EX

Message	Explanation and/or corrective action	Level
Unable to move desktop	The desktop is moved when switching into user mode. This prevents them from being visible if the application is exited and restarted by the timer. This error does not affect the screen mode switch; processing continues.	LOG_ERROR
Unable to move taskbar	The taskbar is moved when switching into user mode. This prevents them from being visible if the application is exited and restarted by the timer. This error does not affect the screen mode switch; processing continues.	LOG_ERROR
Unhook taskbar wndproc failure	AppLock could not remove its control of the taskbar. This error does not affect AppLock processing	LOG_ERROR
Unhook wndproc failure	AppLock could not remove the hook that allows monitoring of the application.	LOG_ERROR
Unhooking taskbar	In administration mode, the taskbar should return to normal operation, so AppLock's control of the taskbar should be removed.	LOG_EX
Unhooking wndproc	When the administrator leaves user mode, the device is fully operational; therefore, AppLock must stop monitoring the locked application.	LOG_EX
WM_SIZE adjusted	This message denotes that AppLock has readjusted the window size.	LOG_EX
X after Ctrl+L	Processing the backdoor entry.	LOG_EX
Ret from password <#>	Return value from password dialog.	LOG_EX
Decrypt data len <#>	Length of decrypted password.	LOG_EX
Window handle to enumwindows=%x	The window handle that is passed to the enumeration function. This message can be used by engineering with other development tools to trouble shoot application lock failures.	LOG_EX
WM_WINDOWPOSCHG adjusted=%x	Output the window size after it has been adjusted by AppLock	LOG_EX
Term process restart –window not found	The locked application has been closed using a method that cannot be detected by AppLock. AppLock will restart the application.	LOG_ERROR

AppLock Registry Settings

This system application runs at startup via the "launch" feature of LXE Windows CE .NET devices. When the launch feature is installed on the device, the following registry settings are created. The launch feature registry settings are embedded in the mobile device OS image:

```
HKEY_LOCAL_MACHINE\\Software\\LXE\\Persist\\Filename=AppLock.exe
HKEY_LOCAL_MACHINE\\Software\\LXE\\Persist\\Installed=
HKEY_LOCAL_MACHINE\\Software\\LXE\\Persist\\FileCheck=
```

AppLock registry settings identify the application that is going to be locked and any parameters that are needed by the application. These registry settings are as follows:

```
HKEY_LOCAL_MACHINE\\Software\\LXE\\Administration\\AppName
HKEY_LOCAL_MACHINE\\Software\\LXE\\AppCommandLine=
```

In addition to the registry settings needed to specify the application, additional registry settings are needed to store the configuration options for AppLock. These options include, among others, the administrator's password and hotkey.

```
HKEY_LOCAL_MACHINE\\Software\\LXE\\AppLock\\Administration\\HotKey=
HKEY_LOCAL_MACHINE\\Software\\LXE\\AppLock\\Administration\\EP=
```

Appendix A Key Maps

95-key Keypad with Pointing Device

Esc F1 F2 F3 F4 F5 F6 F7 F8 F9 F10 F11 F12 Print Screen SysRq Scroll Lock Pause Break Fn
BackSpace Num Lock
Tab Q W E R T Y U I O P 7 Home 8 9 PgUp
Caps Lock A S D F G H J K L Enter 4 5 6
Shift Z X C V B N M Shift 1 End 2 3 PgDn
Ctrl Alt Alt Ctrl 0 Ins Del Enter

Figure A-1 95-Key VMT QWERTY Keyboard

The key map table that follows lists the commands used for the VX7. Note that since the VX7 uses a Microsoft Windows CE .NET operating system, no DOS Terminal Emulation keypress sequences are provided.

Key Map 101-Key Equivalencies

There are ten hidden keys on the 95-key keyboard. Each of these hidden keys is accessed by pressing the <Fn> key plus another key.

To get this key	Press These Keys and Then
Insert	Fn + 0 on the number pad
Home	Fn + 7 on the number pad
Page Up	Fn + 9 on the number pad
Delete	Fn + . on the number pad
End	Fn + 1 on the number pad
Page Down	Fn + 3 on the number pad
Up Arrow	Fn + 8 on the number pad
Left Arrow	Fn + 4 on the number pad
Down Arrow	Fn + 2 on the number pad
Right Arrow	Fn + 6 on the number pad

Note: The 95-key keyboard does not have a 2nd key function.

60-key Standard Keypad

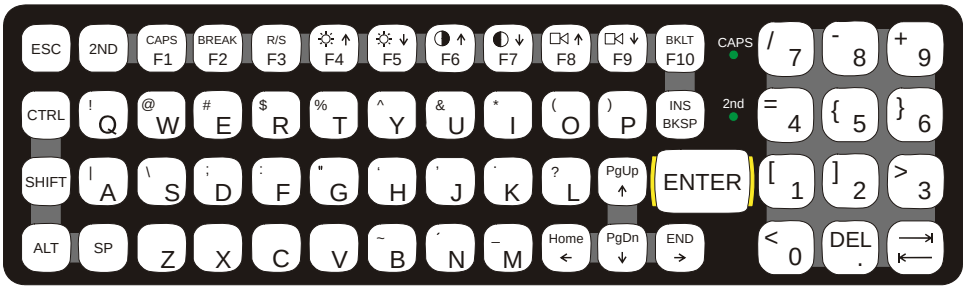


Figure A-2 60-Key VMT QWERTY Keyboard

The key map table that follows lists the commands used when running LXE's VX7.

Key Map 101-Key Equivalencies

When using a sequence of keys that includes the 2nd key, press the 2nd key first then the rest of the key sequence.

Note: This keyboard does not have a NumLock indicator. By default, NumLock is enabled when the VX7 reboots. The warmboot behavior of NumLock can be configured. Please refer to Chapter 4, "System Configuration".

The default condition of Caps (or CapsLock) is Off. The Caps (or CapsLock) condition can be set toggled with a <2nd>+<F1> key sequence. The CAPS LED on the VMT keyboard is illuminated when CapsLock is On.

To get this key	Press These Keys and Then					Press this key
	2nd	Shift	Ctrl	Alt	CapsLock	
Increase Brightness [3]	x					F4
Decrease Brightness [3]	x					F5
Increase Contrast [4]	x					F6
Decrease Contrast [4]	x					F7
Increase Volume [5]	x					F8
Decrease Volume [5]	x					F9

[3] The Brightness Adjustment keys have no function. Brightness is adjusted via the buttons on the VX7 control panel.

[4] The Contrast Adjustment keys have no function because the VX7 is equipped with a TFT display that has no provision for these adjustments.

[5] The Volume Control keys have no function as the volume control is adjusted via the Windows System Tray Volume icon.

To get this key	Press These Keys and Then					Press this key
	2nd	Shift	Ctrl	Alt	CapsLock	
Keyboard Backlight [6]	x		x			F10
Suspend/Resume [7]	x					F3
2nd						2nd
Shift						Shift
Alt						Alt
Ctrl						Ctrl
Esc						Esc
Space						Sp
Enter						Enter
Enter (numeric)	x					Enter
CapsLock (Toggle)	x					F1
Back Space						Ins/BkSp
Tab						Tab
BackTab	x					Tab
Ctrl-Break [8]	x		x			F2
Pause	x					F2
Up Arrow						Up Arrow
Down Arrow						Down Arrow
Right Arrow						Right Arrow
Left Arrow						Left Arrow
Insert	x					Ins/BkSp
Delete (numeric)	x					DOT
Home	x					Left Arrow
End	x					Right Arrow
Page Up	x					Up Arrow
Page Down	x					Down Arrow
Right Shift	x	x				F7
Right Alt	x	x				F8
Right Ctrl	x	x				F9
ScrollLock	x	x				F4
NumLock	x	x				F10
F1						F1
F2						F2
F3						F3

[6] The Keyboard Backlight key is used in <2nd> + <CTRL> + <F10> key sequence. Refer to "VMT Keyboard Backlighting" in Chapter 4, "System Configuration".

[7] The Suspend/Resume key has no function as Windows Power Management controls all power management modes on the VX7.

[8] Press <Ctrl> then <2nd> then <F2> to produce Ctrl-Break.

To get this key	Press These Keys and Then					Press this key
	2nd	Shift	Ctrl	Alt	CapsLock	
F4						F4
F5						F5
F6						F6
F7						F7
F8						F8
F9						F9
F10						F10
F11	x	x				F1
F12	x	x				F2
a						A
b						B
c						C
d						D
e						E
F						F
g						G
h						H
I						I
j						J
k						K
l						L
m						M
n						N
o						O
p						P
q						Q
r						R
s						S
t						T
u						U
v						V
w						W
x						X
y						Y
z						Z
A					x	A
B					x	B
C					x	C
D					x	D
E					x	E

To get this key	Press These Keys and Then					Press this key
	2nd	Shift	Ctrl	Alt	CapsLock	
F					x	F
G					x	G
H					x	H
I					x	I
J					x	J
K					x	K
L					x	L
M					x	M
N					x	N
O					x	O
P					x	P
Q					x	Q
R					x	R
S					x	S
T					x	T
U					x	U
V					x	V
W					x	W
X					x	X
Y					x	Y
Z					x	Z
1 (alpha)	x	x				1
2 (alpha)	x	x				2
3 (alpha)	x	x				3
4 (alpha)	x	x				4
5 (alpha)	x	x				5
6 (alpha)	x	x				6
7 (alpha)	x	x				7
8 (alpha)	x	x				8
9 (alpha)	x	x				9
0 (alpha)	x	x				0
DOT (alpha)	x					K
1 (numeric)						1
2 (numeric)						2
3 (numeric)						3
4 (numeric)						4
5 (numeric)						5
6 (numeric)						6
7 (numeric)						7
8 (numeric)						8

To get this key	Press These Keys and Then					Press this key
	2nd	Shift	Ctrl	Alt	CapsLock	
9 (numeric)						9
0 (numeric)						0
DOT (numeric)						DOT
<	x					0
[	x					1
]	x					2
>	x					3
=	x					4
{	x					5
}	x					6
/ (numeric)	x		x			7
/ (alpha)	x					7
- (numeric)	x		x			8
- (alpha)	x					8
+ (numeric)	x		x			9
+ (alpha)	x					9
* (numeric)	x					I
* (alpha)	x		x			I
: (colon)	x					D
; (semicolon)	x					F
?	x					L
`	x					N
_ (underscore)	x					M
, (comma)	x					J
‘ (apostrophe)	x					H
~ (tilde)	x					B
\	x					S
|	x					A
“	x					G
!	x					Q
@	x					W
#	x					E
$	x					R
%	x					T
^	x					Y
&	x					U
(	x					O
)	x					P

IBM 3270 Keypad Ovelay

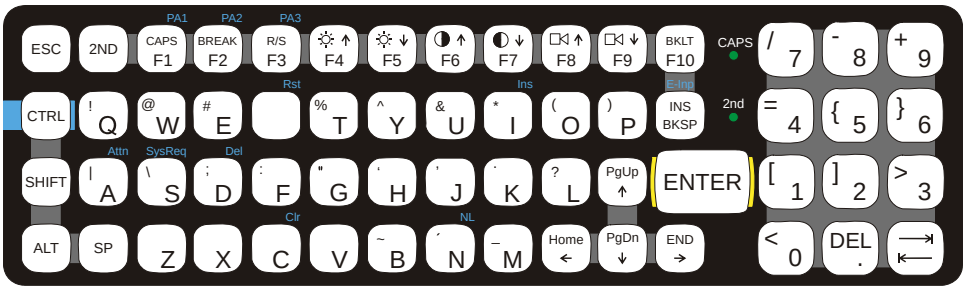


Figure A-3 IBM 3270 Specific Keypad

The 60-key keypad is available with an IBM 3270 overlay designed to allow the user to enter terminal emulator commands when running LXE's RFTerm™ program. When running this program please refer to the following reference guide for equivalent keys and keypress sequences:

- RFTerm™ Reference Guide

IBM 5250 Keypad Overlay

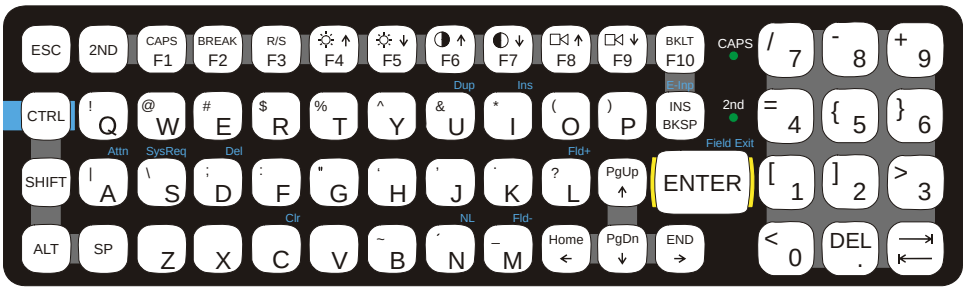


Figure A-4 IBM 5250 Specific Keypad

The 60-key keypad is available with an IBM 5250 overlay designed to allow the user to enter terminal emulator commands when running LXE's RFTerm™ program. When running this program please refer to the following reference guide for equivalent keys and keypress sequences:

- RFTerm™ Reference Guide

Appendix B Technical Specifications

Physical Specifications

Features		Specification	Comments
CPU		400MHz Intel® PXA255	
Memory	RAM	64 or 128MB DRAM	
Display	Controller	SVGA compatible controller	
	Type	TFT	
Mass Storage	Compact Flash	64 or 128MB	
	PCMCIA		
	Secure Digital	16Mb, 64MB, 128MB and 256MB	
PCMCIA/CardBus Interface		Two (2) PCMCIA: Accepts Type I and II PCMCIA cards.	
External Connectors/ Interfaces		Two (2) external RS-232C serial ports: COM1 and COM3 [9]	9-pin "D" (male) connectors
		One USB Host and one USB Client Port One (1) Ethernet Port	Via Adapter Cable
Power Connector		12-80V DC input power	5-pin connector
Power Switch		Sealed power switch	
Beeper		Minimum loudness greater than 95dBm at 10 cm in front of unit	
Dimensions		Length: 12.2 in (30.98 cm) Width: 9.6 in (24.38 cm) Depth: 3.7 in (9.39 cm)	
Battery for CMOS		Internal lithium Battery	
External Power Supply	AC Adapter	120-240VAC to 12VDC	

[9] COM3 is labeled "COM2/3".

Environmental Specifications

The VX7 will withstand the following environmental characteristics and has been tested in accordance with applicable sections of MIL-STD-810E.

Feature	Specification
Altitude	Operational to 10,000 ft. (3048 meters)
Operating Temperature	Standard version: -4°F to 122°F (-20°C to 50°C) [non-condensing] Extended temperature version: -22º to 122º F (-30ºC to 50ºC [condensing]
Storage Temperature	Standard version: -22°F to 140°F (-30°C to 60°C) [non-condensing] Extended temperature version: -22°F to 140°F (-30°C to 60°C) [condensing]
Water, Sand and Dust	IP66 per IEC60529
Humidity	Standard version: Up to 90% Non-condensing at 40°C (104°F) Extended temperature version: 100%
Vibration	Bounce loose cargo for 0.5 hour duration. Common carrier transportation, transit face.
ESD	15 kV
Shock	75G, 5msec duration, 100 shock impacts

Display Specifications

Characteristic		Specification
Type	TFT	SVGA
Resolution		Default: 800 X 600 pixels (25 lines x 80 characters) Optional: 640x480 pixels on Platform 2 VX7s.
Cell Size		8 x 16 pixels (8 x 8 also supported – 25 lines x 80 chars)
Dot Dimensions		.30mm x .30mm
Display Dimensions		280mm x 218mm x 11mm (11.0” x 8.6” x 0.4”)
Viewing Area		249mm x 187.5mm (9.8” x 7.38”)
Active Display Area		246mm x 184.5mm (9.7” x 7.26”)

UPS Battery Pack Specifications

Feature	Specification
Altitude	Operational to 10,000 ft. (3048 meters)
Operating Temperature	-30 °C to +50 °C (-22 °F to +122 °F)
Storage Temperature	-40 °C to +70 °C (-40 °F to +158 °F)
Water, Sand and Dust	IP66 per IEC60529
Humidity	10-90% Non-condensing at 40°C (104°F)
Vibration	Bounce loose cargo for 0.5 hour duration. Common carrier transportation, transit face.
ESD	15 kV

Radio Specifications

Summit CF 2.4GHz

Bus Interface:	Compact Flash via a PCMCIA adapter
Radio Frequencies:	2.4 - 2.4897 GHz IEEE 802.11b 802.11g DSSS OFDM
RF Data Rates:	1, 2, 5.5, 6, 9, 11, 12, 18, 24, 36, 48, 54 Mbps
RF Power Level:	64 mW (18 dBm)
Channels	11 US, 13 Europe, 13 Japan
Operating Temperature	see VX7 Environmental Specifications
Storage Temperature	see VX7 Environmental Specifications
Connectivity:	Novell, TCP/IP, Ethernet, ODI

PCMCIA Cisco 2.4GHz Type II

Bus Interface:	PCMCIA 2.0, Type II slot
Radio Frequencies:	2.4 - 2.4835 GHz IEEE 802.11b DS SS
RF Data Rates:	11 Mbps
RF Power Level:	100 mW
Channels	11 US, 13 Europe, 4 France, 1 Japan
Operating Temperature	see VX7 Environmental Specifications
Storage Temperature	see VX7 Environmental Specifications
Connectivity:	Novell, TCP/IP, Ethernet, ODI

PCMCIA Symbol 11Mb 2.4GHz Type II

Bus Interface:	PCMCIA 2.0, Type II slot
Radio Frequencies:	2.4 - 2.5 GHz IEEE 802.11b DS SS
RF Data Rates:	11 Mbps maximum
RF Power Level:	100 mW
Channels	11 US, 13 Europe, 4 France, 1 Japan
Operating Temperature	see VX7 Environmental Specifications
Storage Temperature	see VX7 Environmental Specifications
Connectivity:	Novell, TCP/IP, Ethernet, ODI

Revision History

Revision A, Initial Release: November 2004

Revision B: August 2005

Section	Explanation
Chapter 1 – Introduction	Revised “Document Conventions”, “When To Use This Guide”, “Touchscreen and Mouse” and “Accessories” sections. Specified the proper USB adapter cable to use in “Connect” section.
Chapter 2 – Physical Description and Layout	Added “Identifying Your VX7”, “USB Keyboard/Mouse” and “Touchscreen Heater” sections. Updated “Video Subsystem”, “Antenna Connections”, “The Keyboards”, “On/Off Switch”, “General Windows CE .NET Keyboard Shortcuts” and “CAPS LED” sections. Replaced “CapsLock, Scroll Lock and the VX7” section with “CapsLock and the VX7” and “Scroll Lock and the VX7” sections. Replaced “Antenna Connector” section with “Antenna Connections” section.
Chapter 4 – System Configuration	Revised “About”, “Administrator Control”, “LAUNCH.EXE”, “Reflash the VX7”, “Accessibility” and Date/Time” sections. Added “2.4GHz Radio Configuration”, “Changing the Display Resolution”, “Disabling the Touchscreen Heater”, “Configuring CapsLock Behavior” and “Configuring IPv6 Broadcast Messages” sections. Removed “Cisco – Aironet Configuration Utility (ACU)” and “Symbol” sections. This information is now included in Chapter 5.
Chapter 5 – Wireless Network Configuration	Added new chapter containing sections removed from Chapter 4.

Revision C: October 2005

Section	Explanation
Chapter 1 – Introduction	Updated “When To Use This Guide”. Updated “Accessories” list.
Chapter 4 – System Configuration	Renamed “Configuring IPv6 Broadcast Messages” section to “Configuring IPv6” and revised section.
Chapter 5 – Wireless Network Configuration	Revised “Introduction” and “Cisco – Aironet Client Utility (ACU)” section. Renamed “Configuring VX7 Radio” to “Configuring VX7 Radio Without WPA”. Added “WPA for the VX7” section.

Revision D: June 2006

Section	Explanation
Entire Manual	Updated all images with the new LXE logo.
Notices	Updated copyrights and trademarks.
Chapter 1 – Introduction	Revised “Accessories” listing.
Chapter 2 – Physical Description and Layout	Revised “On/Off Switch”, “Scanner Serial Connector (COM1)”, “Printer/PC Serial Connector (COM3)”, “Install the 2.4GHz Type II PCMCIA Radio”, “Input Panel (Virtual Keyboard)”, “Video Subsystem” and “The Display” . Added new section: “Technical Specifications – Screen Blanking Cable”.
Chapter 3 – Power Supply	Revised “VX7 Input Power Specifications”.
Chapter 4 – System Configuration	Revised “Installed Software”, “Start Menu Program Options”, “Network and Dialup Connections”, “Control Panel Options”, “About”, “Date/Time”, “Keyboard”, “Password”, “Regional Settings”, “Remote Desktop Connection”, “Scanner”, “Storage Manager”, “LAUNCH.EXE” and “Reflash the VX7” sections. Added new sections: “Folders Copies at Startup” and “Enabling GrabTime”. Removed section: “Bluetooth Manager”. Renamed “VX7 Command Line Utility” to “VX7 Command Line Utilities” and updated section.
Chapter 5 – Wireless Network Configuration	Revised “Profiles Tab” section. Split radio configuration section into two sections “Cisco Radio” and “Symbol radio”. Added a new section, “Summit Radio”. Each section contains the manufacturer specific configuration information. Moved all certificate generating and installation instructions to a new “Certificates” section.
Chapter 6 – AppLock	New chapter. Information previously included in Appendix B is now referred to as “Single Application”. Added Multi Application AppLock to chapter.
Appendix B – Technical Specifications	Added “Revision History” to appendix. Added Summit Radio Technical Specifications.
Appendix C – AppLock	Deleted appendix. Information is now included in Chapter 6, AppLock.

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